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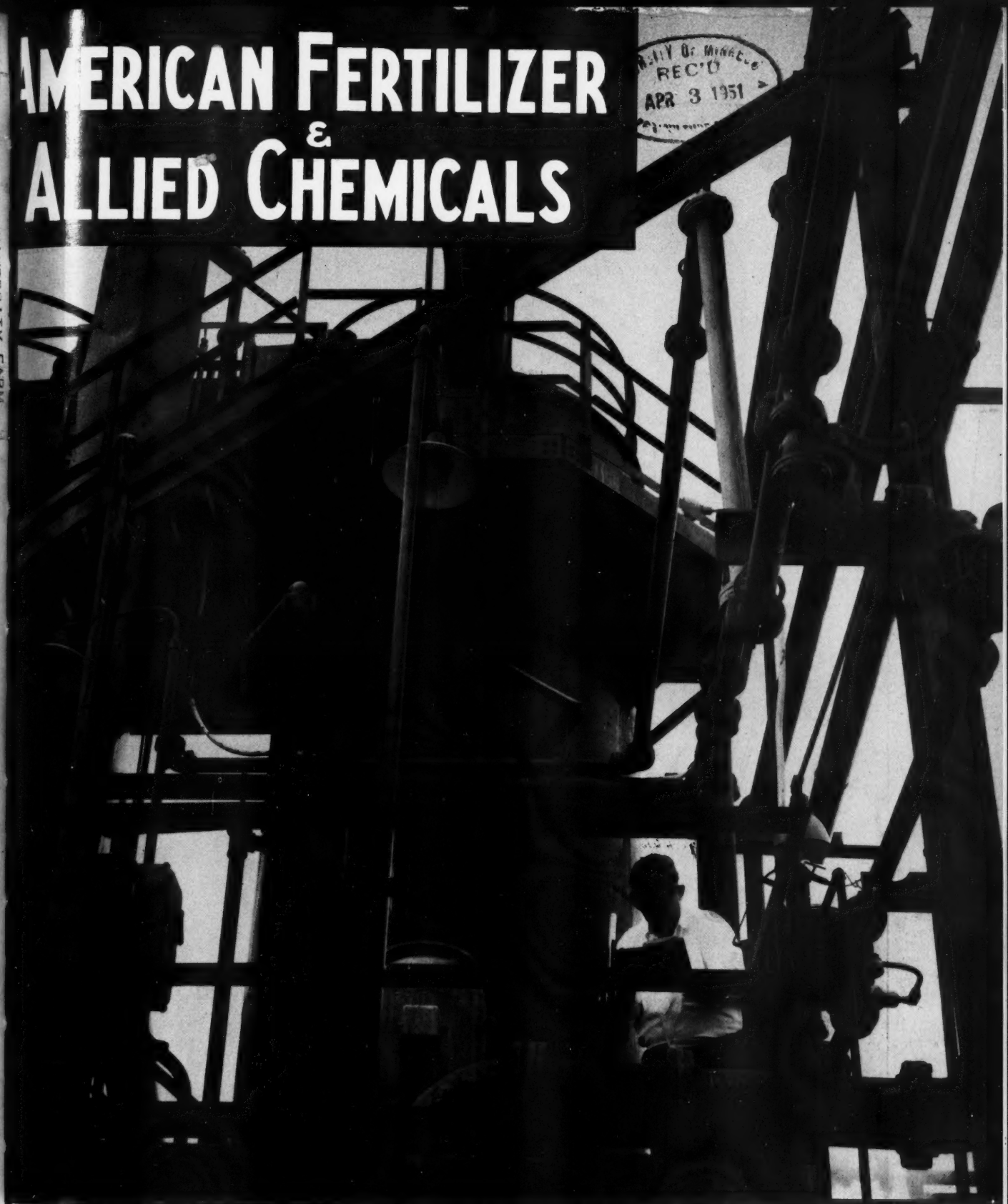

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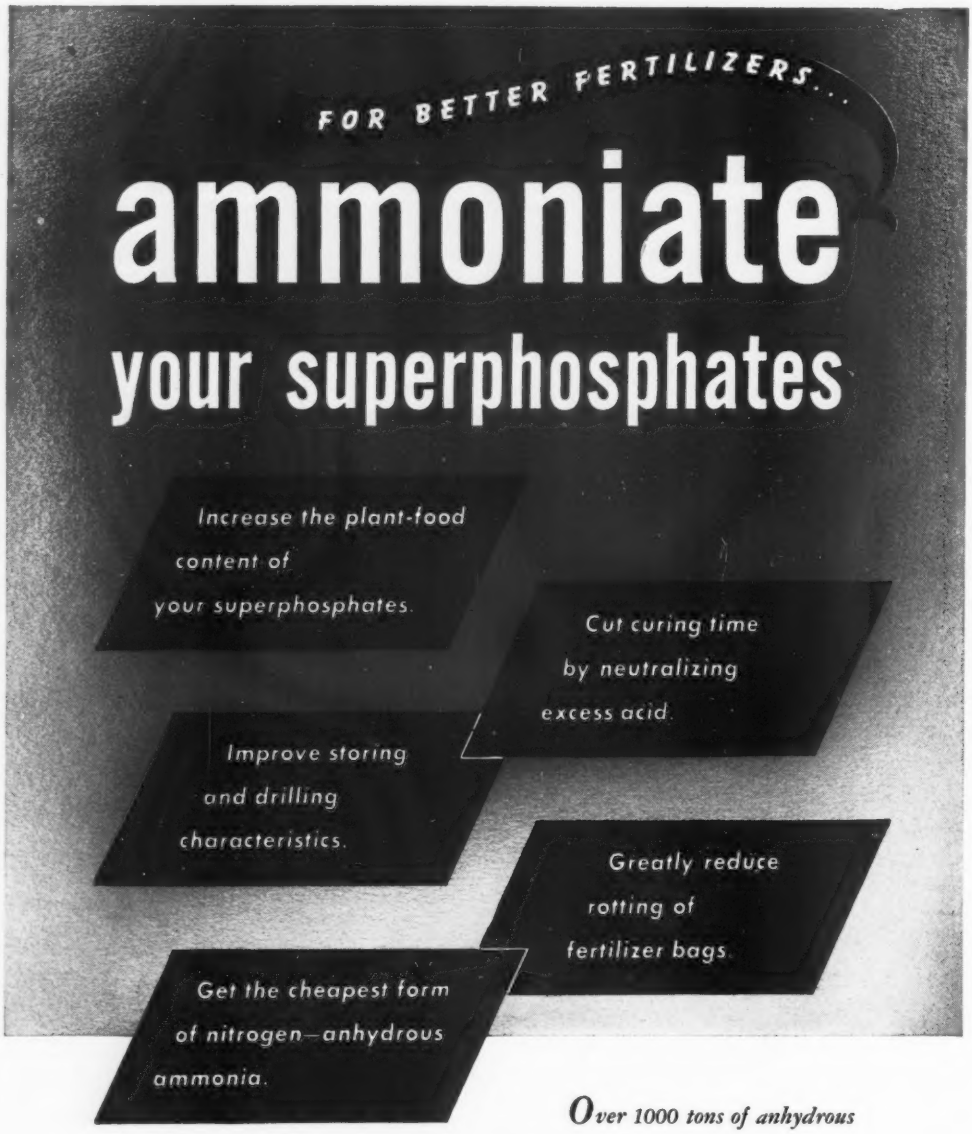
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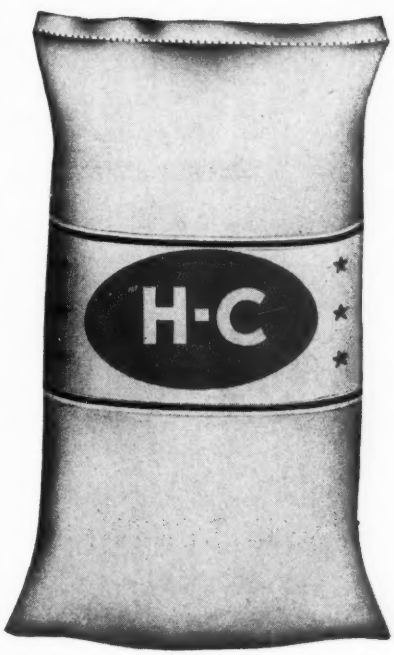

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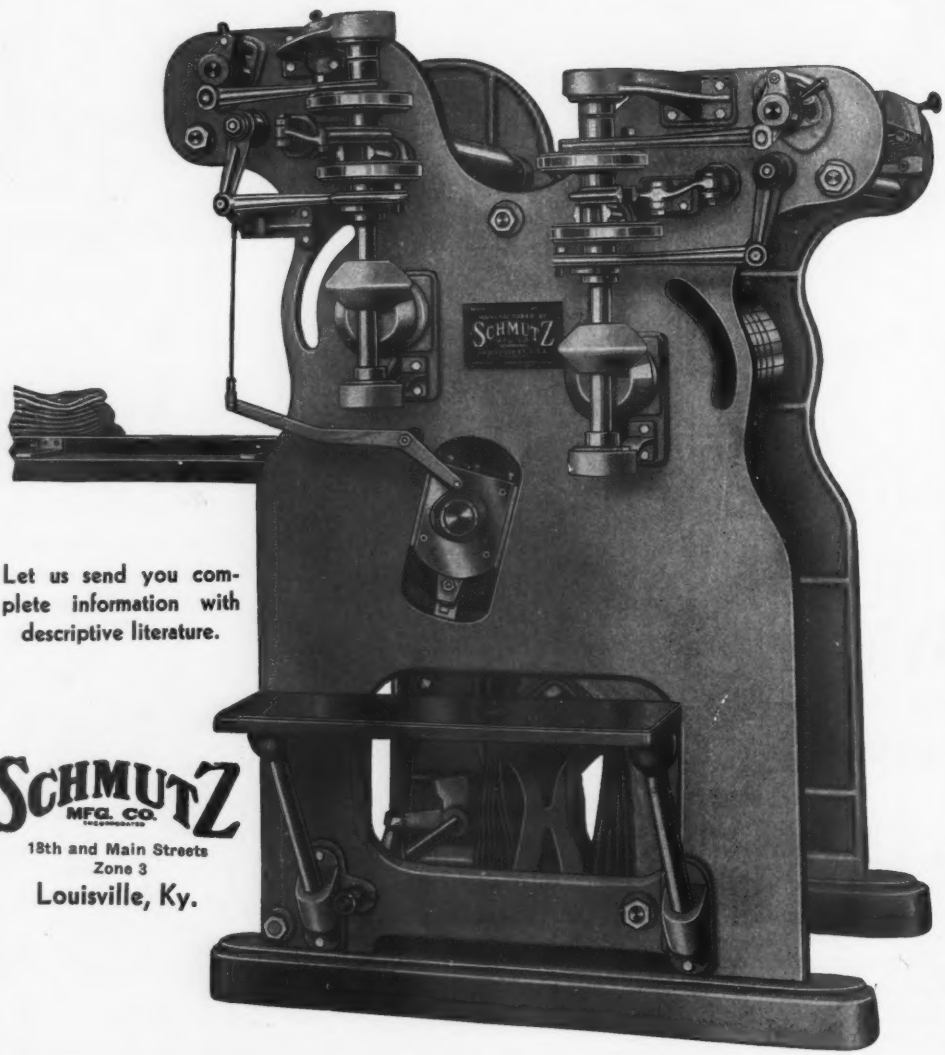

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In this issue . . .

Last month we began our newest department "Trends & Forecasts"—an up-to-the-minute look at the way things relating to the fertilizer and allied chemicals industry are going in Washington. The look is made by two astute observers of both agriculture and official Washington, Fred Bailey and Don Lerch.

Fred Bailey—whose farm column appears in more than 20 national farm magazines—is a native of Texas, where he was "raised on cotton, grain, and cattle farms." A 1927 graduate of the Missouri School of Journalism, Fred managed United Press bureaus in Jefferson City, Mo., Memphis, Tenn., and St. Louis, Mo., before going to Chicago in 1933 to become UP's midwestern night editor. From 1945 until 1947 he was chief of the National Grange Washington legislative staff. He has been editor of the *Washington Farm Reporter*, a weekly Washington agricultural letter, since 1944. Besides his many farm columns, Fred has authored many magazine articles on agricultural subjects.

Don Lerch—who began his career in agriculture by selling fertilizers for American Agricultural Chemicals Company—has specialized for more than a decade in serving in one capacity or another both in private industry and USDA. Don left his job on the sales staff of "Double-A See" for radio and a position as director of agriculture for KDKA in Pittsburgh. As director of information Don was with the USDA during the war both in Washington and the New York regional office.

Later, Don directed agriculture for WNBC, New York City, following which he accepted the post of director of agriculture for the CBS network farm program, Columbia Country Journal. To report on both the business and "country-living" side of agriculture, Don has travelled throughout the United States and has won numerous awards from the Institute for Education for Radio and the National Safety Council.

Before teaming up with Fred to form their editorial advisory service for agriculture, Don was director of information for the National Agricultural Chemicals Association—which comprises 85 per cent of the basic producers of pesticides.

With this background, plus their ability to ask the right questions of the right people, we know that their monthly reports —purposely brief and to the point—will help executives of farm chemicals manufacturing companies follow the trends and make valuable use of the forecasts as seen from Washington by Bailey and Lerch.

• • •

The shortage of sulfur and sulfuric acid did not develop overnight. And it isn't likely to be solved overnight either. But the way things were going it looked like the fertilizer industry—in spite of its record as the nation's foremost user of the materials —was going to be left holding the bag unless something were done, and soon. Something was done and the Congressional committee that did it pulled no punches in reporting what they found as a result of their investigation of fertilizer and farm machinery. They did not hesitate to say what, precisely, they thought should be done to improve the situation. Their report, as well as some background information about the part sulfur plays in the fertilizer industry is in our lead article, beginning page 13.

• • •

The sight of an airplane swooping in low over a field of crops and swishing its tail of insect-smothering dust has always fascinated us. But it came as surprise to us to learn that of the 60 industrial uses of aircraft, 40 are in the field of agriculture. This is but one detail included in the wealth of facts experienced reported by national experts at the National Agricultural Aviation Conference in Memphis, February 19–20. We wanted to go ourselves, but more pressing matters tied us to the old desk. So we called the National Cotton Council of America whose offices are in Memphis and who was one of the sponsors of the confab. They put their public relations man Bill Foreman on the job and you can see how well he came through for us by reading his interesting and complete report which starts on page 18.

• • •

Materials-handling in farm chemicals plants is one phase of production that is constantly undergoing development. Link-Belt—one of the world's leading pioneers in designing, making, and installing this type of equipment—recently completed an installation at the FASCO plant in Jacksonville, Fla. It is a good example of how some vexing problems in maintaining a smooth and economical flow of materials through the plant can be overcome by the use of equipment of modern design. For story and pictures, see page 20.

• • •

There's a lot of other good, solid reading from cover to cover in this issue of our favorite farm chemicals journal. It deals with news of the industry, new equipment for your plant, and a scientific report on chemical control of the Mexican Bean Beetle —a nasty little bug that doesn't confine its activities to either Mexico or beans and last year did $000,000 of damage to crops in 21 states. You'll also find our regular features giving statistics of the industry and reporting prices of fertilizer materials in various sections of the country.

AMERICAN FERTILIZER & ALLIED CHEMICALS

Established 1894

PIONEER JOURNAL OF THE FERTILIZER INDUSTRY

Vol. 114 MARCH, 1951 No. 3

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Cover Story

At present, and probably for some time to come, the crux of an adequate supply of fertilizer is the manufacture of sulfuric acid from elemental sulfur, an element in short supply. The contact acid plant on our cover this month is installed at Swift and Company's Norfolk, Va., plant. The entire output of this Monsanto-designed unit goes into the production of superphosphate.

Photo courtesy of Monsanto Chemical Company

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Trends & Forecasts

An Exclusive and Timely Report from Washington by Fred Bailey & Don Lerch

Hungry bellies and higher food prices were promised consumers by Representative Tom Abernathy unless farmers receive adequate supplies of fertilizer, pesticides, machinery, etc. His special subcommittee report is given added emphasis by approval of full House Agriculture Committee.

Admission by Joseph S. Bates, chief of NPA's chemicals branch that no one in his office really knew the needs of agriculture is the crux of the investigation.

Severe criticism leveled at NPA by the sub-committee points up failure to consider agriculture as an essential defense industry, lack of foresight in calling for sulphur conservation in government-aided industrial expansion, absence of agricultural staff assistance and general policy directives.

NPA will act--give somewhat more attention to agriculture's needs.

Sulphur allocation will point to users of sulphuric acid, particularly those who now have "acid disposal problems." Substantial re-use possibilities are seen in the petroleum, natural gas, steel, chemical, and paper industries. Success depends largely on re-use of recoverable acid.

Preparations for the allocation order are well under way. Over 125 major sulphuric acid users have received special questionnaires from NPA, similar to the old WPB forms.

John G. McMullen and John F. Wood are the new NPA "sulphur experts" who analyze the returns. Final order will reflect some of their conclusions. Both are "industry men," McMullen arriving in Washington from the General Chemical Co., Wood from the Texas Gulf Sulphur Co.

The usual trouble with desks, chairs and telephones was experienced. Other seasoned, pre-1951 executives, react with that smug look—after all, one outfit kept nine men going for months with five desks and as many chairs. As for telephone extensions, that's never permanent anyhow.

Allocation will channel sulphur and acid for fertilizer, pesticides, and other uses. But acid takes many twists and turns before it's "spent" and fertilizer is often at the end of the road. It is hoped that discussion of this and other problems by the NPA sulphuric acid committee will remove some of the fuzzy spots.

Test of the order will be how much goes to Agriculture. If amount is "reasonable" it will indicate that some of the "potato surplus dream" has been dispelled. Some men who don't know agriculture have a hard time understanding that there are no major stockpiles of any agricultural commodity--that we must grow what we eat. Maybe the USDA should give some short courses on the corn-hog ratio.

Glamour was added to the fertilizer bag when Jesse Johnson, Atomic Energy Commission revealed that considerable amounts of uranium can be obtained from the triple superphosphate process.

Price changes for fertilizer industry are not expected to be ready for administration until the Spring season is about over. Some emergency price relief for "dislocated tonnage" will affect but a very small percentage of total sales.

Announcements of new industry committees in NPA, OPS, and USDA will show the "who's who" among advisors to the government. Industry is pressing for earlier release of lists to end the mystery and suspicion.

Record nitrogen and potash supplies are expected for the 12 months period ending June 30th. Nitrogen 1,250,000 tons N, up 20%; potash 1,300,000 tons K_2O, up 15%; and phosphates 1,921,000 tons P_2O_5, down 6% compared with 1949-50 period.

USDA is primed for the Delaney investigation on pesticides. Smarting from the polite brush-off received in the opening rounds last year, officials have sharpened their attack. They are making a determined effort to separate pesticides from the food phase of the investigation.

Definite legislative recommendations by the committee are forthcoming, however. The least to be expected is a tightening of the existing Federal Insecticide Act administered by the USDA. The $75,000 appropriated to the Committee compared to $30,000 last year presupposes a lengthy investigation.

Food and Drug will continue to fight for greatly expanded controls over pesticides including extended chronic toxicity studies. They have not been satisfied with answers to their questions about the long-range toxicity of the new organics such as DDT, Chlordane and BHC.

Industry leaders themselves may be called upon to take the stand in order to justify legislation acceptable to them.

Appointment of Representative Walt Horan (R. Wash.), to fill the vacancy created by former Committee member Keefe, gives the 7-member Committee a stronger agricultural point of view. His acceptance is generally approved by farm and grower organizations!

Multitude of state pesticide legislation is moving industry experts on the double. In general, the bills call for either increased control over sales, and application of pesticides, increased registration fees or both. Fertilizer manufacturers entering the field by adding pesticides to their products might well keep abreast of changes in state as well as federal laws. They're many more laws to comply with in this field.

Shortages of pesticides are echoing along more and more Washington corridors. NPA is hearing complaints from both Congressmen and growers. DDT and BHC are mentioned most often. Some complaints merely serve notice that supplies will be needed. Others are more specific--tell of dealers out of supplies. Substantial early buying has already occurred. The "psychology of shortage" is very apparent.

A chance that pesticide use will run under a year ago is seen by some entomologists here. They're betting the effect of the cold winter will carry over into summer.

Thomas S. Nichols, board chairman and president of Mathieson Chemical Corporation, has accepted post of special assistant to NPA Administrator Manly Fleischmann.

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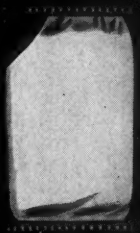

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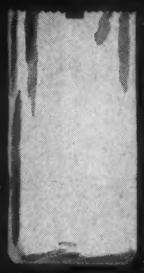

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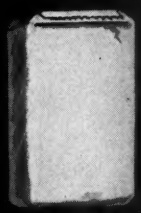

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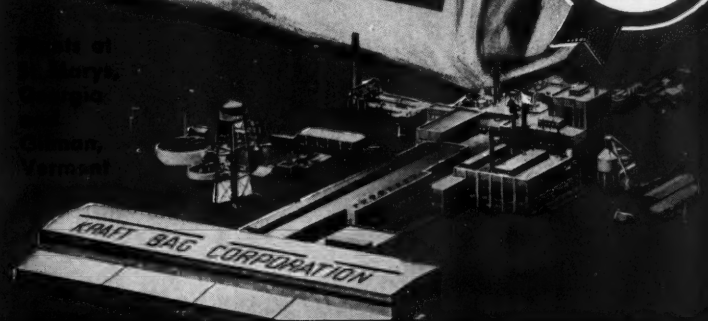

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Let's All Go To Lunch!

It's almost unbelievable, but it happened. A group of men sat down to get the country ready for war and got so engrossed in their task they forgot all about lunch. Not just their own lunch—which, under the circumstances, would have been understandable—but everyone else's lunch as well. The way things turned out, you'd think the nation's top policy makers saw no connection between sulfur, sulfuric acid and, say, a roast of beef or a tossed salad.

That the connection is nevertheless there was pointed out in a succinctly worded report by the House subcommittee investigating fertilizer and farm machinery. "Critical materials—including sulfur and sulfuric acid . . ." said the report, "are being allocated and distributed without any policy determination as to the essential nature of agricultural production and the necessity of fertilizer to that production—apparently on the assumption that farm production is automatic and will occur in ample volume whether farmers have fertilizer or not."

Many critics have in turn been criticized for finding fault with someone else's efforts without making suggestions of their own to improve the situation. This charge cannot be leveled at the thorough-going House subcommittee, however. At the end of their report, the Congressional investigators gave an inclusive list of recommendations (*see page* 13, *this issue*) which would—if acted upon—at least alleviate the situation and give farmers some of the raw materials they need to meet the unprecedented production demands made of them in the interests of the very same defense program that is responsible for the shortage of farm chemicals in the first place.

The problem of allocating materials is not a simple one. There just isn't enough of things to give everyone all he wants of everything at the price he is willing to pay. There never has been. There probably never will be. It is this disparity between supply and demand that establishes the price of things in general. But now the price of almost everything is going up. War included.

How much of our resources-stockpile will be required to halt Russia is anybody's guess. Perhaps not even the Politbureau knows just how much the USSR can chance on expansion without serious risk to everything they have so far gained. Because of this, most people in this country have been willing to accept the fact that we must continue to build up a costly military establishment. After all, it means more jobs, higher wages, big contracts, bigger profits for nearly everyone.

That it also means we may soon have to take in our belts to a painful degree seems not to have occurred to most. If it has, it certainly has not been reflected in demands made by leaders of labor, business, and agriculture. All appear to be out to get all they can for their particular groups while the getting is good. The recent walk-out on defense planning by labor leaders and the continuing prosperity of those unspeakable persons who peddle Washington "influence" for a price demonstrate clearly that grasping and greed are still omnipresent.

This Alice-in-Wonderland "something-for-everybody" has to stop somewhere. Maybe it will stop first in agriculture. It could easily do so. One agency, for example, recently ordered the dumping of 15,000,000 bushels of potatoes in Maine. Herbert W. Moore, retiring executive secretary of the Maine Potato Industry Council, said "there is no reason for dumping" the potatoes, valued at about $9,000,000. Moore said that instead of plowing the potatoes under, they could be used to make about 9,000,000 gallons of commercial alcohol needed for the defense program. This is just one case. But it happened. Before ordering the dumping, did anyone think to ask if some other agency of the government saw a need for the potatoes or products that could be obtained from them? How many times a day is a similar action repeated across the country?

Without any further centralization of authority, this operating at cross-purposes could be stopped almost at once by the President. As Chief Executive, Mr. Truman could require that agency chiefs consult one another on all topics dealing with the purchase, use, or distribution of any and all materials under their jurisdiction. If such liaison work is now being done it is not effective. It can and should be made so.

If it were done effectively, raw materials for precious chemicals would not be plowed under, one agency would not call for an all-time high production of cotton while another agency took away the farm chemicals needed to meet the demand. If that were done, then agriculture would be treated—not as a politically sensitive poor relation seeking over-generous handouts—but, as was asked by Senator Ellender (D-La.) in a letter to Defense Mobilizer Charles E. Wilson, "an essential industry."

Then, supplying agriculture with the chemicals it needs would be within the realm of possibility. As things stand now . . . well, that group of defense planners still hasn't done anything about lunch.

—A. M. Brodine

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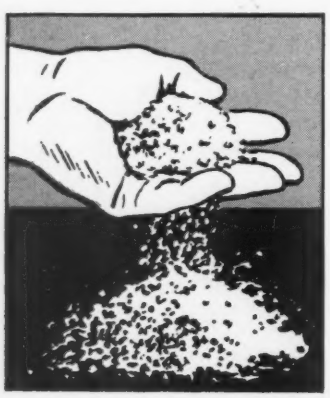

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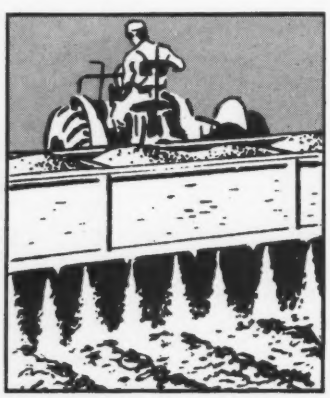

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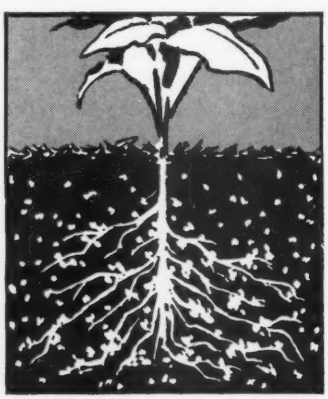


Davison Granulated Superphosphate gives you food control because each granule has a hardened but porous surface . . . releasing plant food at desirable rates.

Progress through Chemistry

THE DAVISON CHEMICAL CORPORATION

Baltimore 3, Maryland

PIONEER PRODUCERS OF GRANULATED, AND ONE OF THE OLDEST AND LARGEST PRODUCERS OF NORMAL GRADES OF SUPERPHOSPHATES

House Subcommittee Gives Recommendations for

Action on Sulfur Shortage

to meet demands for increased foods and fibre production. This means more Sulfur must be alloted for farm chemicals

RECALLING, perhaps, the much publicized stockpiles of potatoes, grain, eggs, and dairy products the government has been buying in such copious quantities these last few years, this apparently came as a surprise to some of the top policy makers in Washington. However, any agriculturist could have told them that *there are no major stockpiles of any agricultural commodities*—the food and fibre we expect to consume in 1951–52 will have to be produced *this year*.

More Food Calls for More H_2SO_4

Reporting this fact, the House of Representatives Special Subcommittee on Fertilizer and Farm Machinery squared off last week on the way things have been handled up to now. "Abundant production," the committee said in a five-page report on its conclusions and recommendations following hearings on fertilizer and sulfur, "is the *only way* to get the food we will need as an instrument of peace and the *best way* to prevent inflationary price increases here at home.

"Such production," continues the report, "*cannot be achieved* without tremendous quantities of fertilizer—*more* fertilizer, not less, than was used last year. Sulfuric acid is a basic ingredient of ammonium sulfate and of almost all phosphate fertilizers."

The fertilizer industry has the means to produce more materials, but only if the sulfur and sulfuric acid bottleneck can be broken. In their hearings on fertilizer and sulfur, the House subcommittee established that at the present time critical materials—including sulfur and sulfuric acid—are being allocated and distributed without any regard for the essential nature of agricultural production and the necessity of fertilizer to that production, "apparently," said the committee, "on the assumption that farm production is automatic and will occur in ample volume whether farmers have fertilizer or not."

Testifying before the group, the head of the National Production Administration division in charge of sulfur distribution reported that no policy directive had been issued to guide him in determining how or with what priority scarce materials are to be distributed. He added that there was no one within his division qualified to represent the agricultural industry in determining these important allotments.

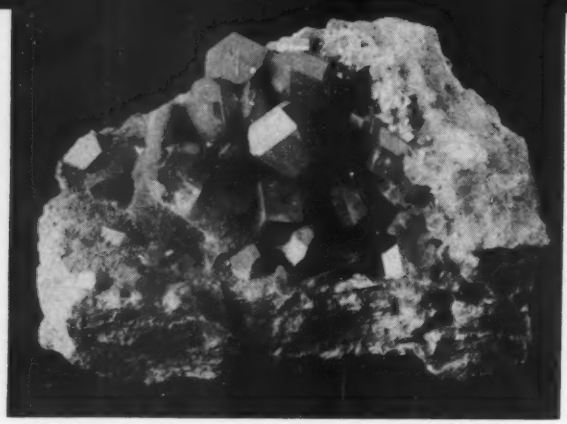
Priorities are now established under a system that disregards the requirements of agriculture and may lead to a critical shortage of materials essential to agricultural production. The committee reported that an allocation order for sulfur and other scarce chemicals has already been drafted but that the USDA was not consulted when the order was formulated. The deputy administrator of the Production and Marketing Administration, USDA, testified that no one in the Department of Agriculture had been able to see a copy of the proposed order although the department had expressed its interest in the order both orally and in writing.

Paul T. Truitt, president of the American Plant Food Council, showed the committee through graphs based on Bureau of Mines statistics that nearly 35 per cent of the sulfuric acid produced and used in the United States during 1949 was consumed by the fertilizer industry. He also demonstrated that the fertilizer and pesticide industries together consumed more than 20 per cent of the elemental sulfur used in this country during the same period.

Shipments Up, Stocks Down

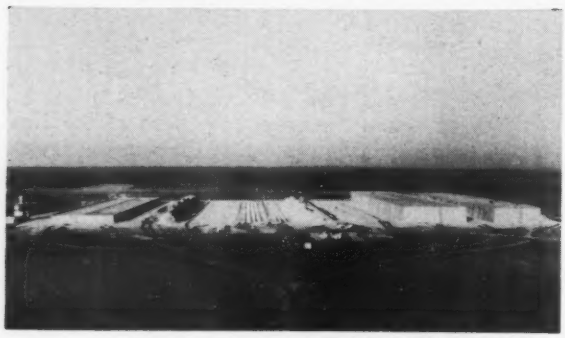
More recent information, released by *Chemical Engineering*, shows that domestic shipments in 1950 reached 4,180,000 tons and more than a million additional tons were exported, bringing the total shipments to at least 5,180,000 tons. This is an increase in apparent consumption of more than a half-million tons over the amount used in 1949.

Production of sulfur by the Frasch process amounted to 5,200,000 tons and another 70,000 tons were recovered from fuel gases. Meanwhile mine stocks of sulfur dwindled at the rate of 87,000 tons per month during 1950 until by the end of December, stock



Museum of Natural History

Elemental sulfur in its natural state, like this sample mined in Italy, is not found in large quantities in this country, most of which occurs in underground domes from which it is recovered by the Frasch method

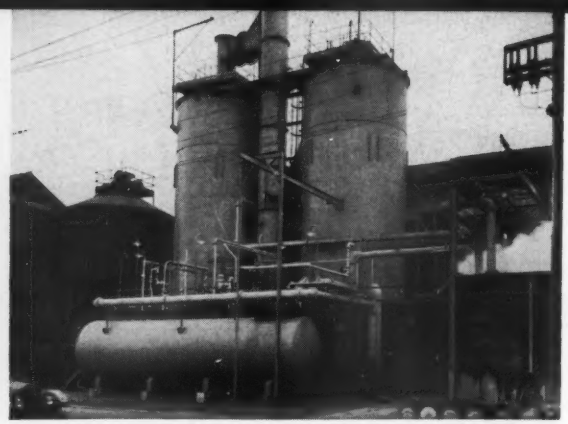


Texas Gulf Sulphur Company

Sulfur, brought to the surface in a molten state, is allowed to cool in beds to form huge stockpiles. Now, these piles, once thought limitless, are dwindling.

Largest single user of sulfur and sulfuric acid is the farm chemicals industry. In 1949, 35 per cent of U. S.-produced sulfuric acid went into the making of superphosphate fertilizer (below). Of the plain sulfur that was used, fully 20 per cent went into pesticides.

Davison Chemical Company



Monsanto Chemical Company

Contact acid plants use sulfur and a catalytic process in units like this Monsanto-designed plant at Everett, Massachusetts, to turn out a large percentage of all the sulfuric acid that is produced in this country

piles at the mines totalled only 2,225,000 tons—a decrease of 425,000 tons in our backlog of crude sulfur. However, the figures do not reflect inventories in the hands of processors.

Agriculture's Needs Neglected

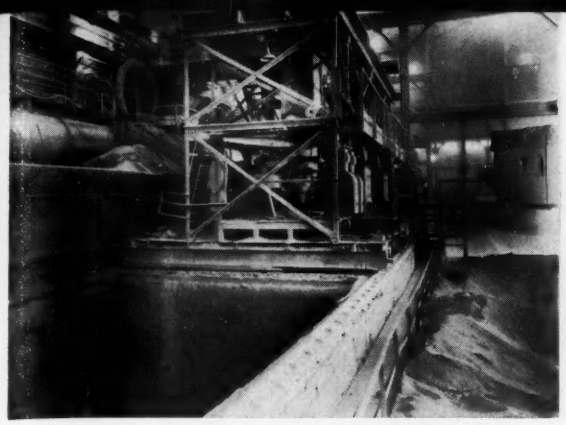
The National Fertilizer Association's president, Russel Coleman, told the committee that increased use of sulfuric acid by such industries as steel, petroleum, and synthetic rubber made necessary by the defense program, had cut the amount available for agriculture to about 75 per cent of last year's supply. In addition to superphosphate, the sulfuric acid shortage has seriously curtailed the production of ammonium sulphate, he said.

All of the evidence gathered by the committee shows that regardless of how allocations are made the situation will remain tight until new methods or materials are brought into use. At the moment agricultural chemicals stand to take a severe setback unless the house committee is successful in driving home the importance of agriculture's position.

New Facilities Being Built

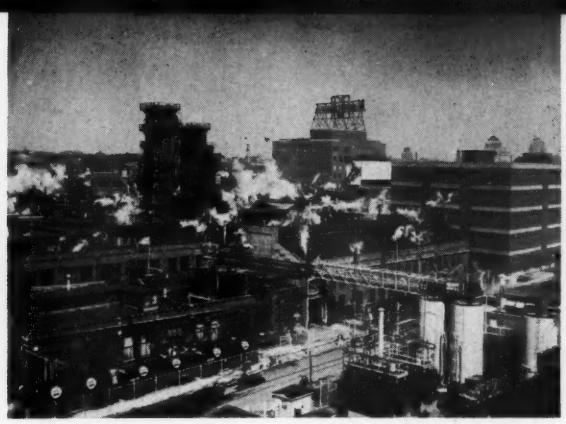
Industry has already begun the construction of additional facilities for the production of sulfur and sulfuric acid. General Chemicals Company is now taking hydrogen sulfide from the Union Oil Company and converting it into sulfuric acid. In Hamilton, Ohio, the American Cyanamid Company is using Chemico's new process for acid production. Chemical engineers say that this process offers several advantages in that smaller plants can be built and operated economically, the investment cost per ton of sulfur is lower than by other production methods, cooling water needs are reduced. The process is simple, they say, and 99 per cent efficient.

American Smelting and Refinery is installing an acid plant in Tacoma, Washington, capable of producing 100 tons of acid per day. Contracts have been let by the National Lead Company for the construction of acid plants in Missouri and New Jersey. Each of these plants will be capable of producing 300 tons of acid per day, to be used for titanium dioxide production. Stauffer has started construction of a 200-ton-per-day acid plant in Southern California.



Davison Chemical Company

Superphosphate plants turned out 1,887 tons of 18 per cent APA material last year, a 3.6 per cent increase over 1949. Supplies during 1951 are expected to fall twenty-five to thirty per cent below the crop demands.



Monsanto Chemical Company

Agricultural chemicals have been by-passed by the NPA in favor of chemical plants, but latest figures available show that such consumption of sulfuric acid in 1949 was 15 per cent below fertilizer use

Jefferson Lake Sulfur has awarded a contract for the construction of additional mining facilities, have completed construction of some facilities, and have a new sulfur mining plant under construction in Texas. Texas Gulf Sulfur has a sulfur mining plant under construction in Texas. They are reported to have put a new plant into operation in Wyoming during 1950. Sid Richardson has plans to recover sulfur from west Texas gas.

All of these projects will aid in long range planning. But the shortage of sulfur is immediate and acute. It cannot be solved by long range planning. It is the immediate aspect of the problem that the House Subcommittee is now concerned with and which must be resolved quickly if the United States is to have the record crop production called for this year.

At the moment there appears to be no immediate possibility of bringing in any new sulfur sources in the United States. However methods of reclaiming spent acid now being discarded have been developed and are used in some industries. Byproduct flotation concentrates are obtained in the production of zinc, copper, and lead. Large quantities of sulfur bearing gases are being released in many industrial processes and could be utilized. To date the recovery of most of these gases has been theoretically possible but not economically feasible. Now, with the increased need for sulfur and sulfuric acid, the demand might make such production a paying proposition. A great deal of attention has been given to this phase of research which is so closely tied to smog abatement problems.

Low-Grade Ores Costly

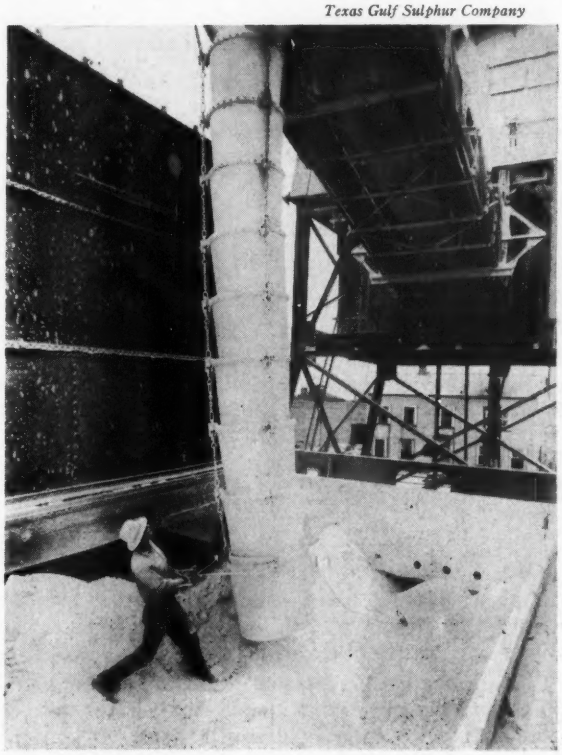
It was pointed out by an official of the Solid Fuels Administration testifying before the committee that the coking industry could obtain from gases now being wasted, 60 per cent of the sulfur needed to convert all of the ammonia released from the ovens, into ammonium sulfate. Such reclamation is possible in the production of petroleum, steel, chemicals, paper and several other materials.

In the past it has proved not to be economical to attempt extraction of sulfur from natural sulfate deposits such as gypsum. Unless new reserves of sulfur are found that can be exploited by the Frasch process we may have to fall back on these low-yield, high-unit-cost materials as our primary source of sulfur. Right now the Chemical Construction Company is constructing a 200-ton-per-day sulfur recovery unit in Columbia which will use low grade sulfur-bearing ores as a basic material. The company believes that similar units can be built and operated profitably in the Western United States.

It is possible that more effective use can be made of materials now being produced. The committee report suggested a review of mixed fertilizer formulas by federal and state authorities should be made with the objective of reducing the application of phosphate to those crops capable of getting along temporarily on smaller amounts of this plant food. The material saved could be utilized for crops directly dependent for increased production on the application of phosphate fertilizers.

Last year over a million tons of sulfur were shipped to foreign countries. Although a cut in exports has been made for the first period of 1951, it will not release enough sulfur for this year's crop goals

Texas Gulf Sulphur Company



As a pesticide, sulfur can be effectively replaced by other materials in many cases. Although sulfur has been used widely in the past as a miticide there are now several chemicals that provide a more effective control. TEPP, aramite, and parathion preparations have all proved better for mite control.

There are some plant diseases for which the use of alternative materials will result in less effective controls. However many ills can be controlled as well or better by using Bordeaux mixture or one of the insoluble coppers.

In addition the newer group of compounds known collectively as dithiocarbamates are excellent disease-control materials. Spergon and Phygon, most often thought of as seed protectants, have applications in this field. Several mildews and brown rot are effectively curbed through the use of Spergon; and Phygon-XL also is effective against some fruit and vegetable diseases.

In the past sulfur has sometimes been used as a carrier or diluent in some pesticidal dusts. When used in this manner sulfur is not generally serving as a pesticide and could well be replaced by some other material that would be just as effective.

Sulfur Exports Still High

Exports have been somewhat reduced for the first quarter of 1951 but will still amount to about 22 per cent of the expected production of elemental sulfur. The House committee reported that although there are good European sources of pyrites, their use has has been declining steadily since the last war. They feel that it is obvious the ECA has made no great effort to get European industries to use the continental pyrites as source of sulfuric acid rather than American sulfur. Members of the group pointed out that it would be well for these countries to shift to their own sources now rather than face the possibility of American supplies being cut off if another world war should develop.

Both Italy and France have deposits that can be exploited more advantageously than has been done in the past. The French deposit is of low-grade ore but new methods have resulted in the production of a higher quality material than had been previously possible. Native deposits in Italy can take care of domestic needs as well as provide large quantities for export. Production in Italy has been expensive due to the primitive methods used, but efforts have been made to modernize their operations.

Spain has large deposits of pyrites which in the past have made sulfur an important export item. The industry was depressed during World War II, but has increased slightly since 1948. Norway, Sweden, Portugal and Germany offer possibilities in the utilization of pyrite deposits. In both Canada and Australia efforts are being made to cut down on sulfur imports, placing more emphasis on local sources. Both countries have pyrite deposits that might be an important source of elemental sulfur.

The committee completed its report with a list of recommendations which members believe will do much to improve the situation. They suggested:

1. That those in charge of the defense program recognize and act upon the elementary fact that agriculture is an essential defense industry and should be given that status in any allocation of critical materials.

2. That advisers and consultants under the supervision and direction of the Secretary of Agriculture qualified and authorized to present the requirements of agriculture, be appointed to participate with the policy-making officials at the highest levels of defense program administration, agencies and authorities.

3. That the export program be critically reviewed with the objective of finding out how much American sulfur the industries of other countries can do without—not how much they would like to have.

4. That the present users of sulfur and sulfuric acid be carefully surveyed to discover how much of this material now being wasted or discarded can be recaptured or reused and that positive steps be taken to see to it that this material is saved and utilized.

5. That all possible long-range sources of sulfur and sulfuric acid be examined and analyzed by competent and appropriate governmental agencies —and that sulfur recovery, production, or reconstitution facilities be required, where appropriate, as a condition of the approval of any facility for accelerated amortization or any other such governmental assistance.

6. That research be intensified to discover whether there is a practical and economic method of producing phosphate fertilizer without sulfuric acid or with proportionately reduced quantities of that material.

Something must be done soon to reconcile supply with demand and agriculture must receive its share of sulfur as well as sulfuric acid if a bumper crop is to be expected this year. Although things look dark at the moment, there are signs of an awakening. Already a few steps have been taken.

Senator Ellender Writes Wilson

In a letter to Charles Wilson, director of the Office of Defense Mobilization, Senator A. J. Ellender (D-La.) expressed the concern among American farmers and their leaders over the situation. Ellender, who is chairman of the Senate Committee on Agriculture and Forestry said in part, "Many agricultural interests have the feeling that they are not receiving deserved recognition as being part of one of the most essential industries in the planning for allocations of fertilizer materials, particularly sulfur and sulfuric acid. . . . Will you please advise me what action has been taken?"

Soon, perhaps as a direct result of the work by House subcommittee, agriculture may attain the high recognition it deserves in the mobilization program.

Lion Anhydrous Ammonia—Manufactured in Lion's modern plant to an 82.25% nitrogen content under accurate chemical control, the uniformity and high quality of this basic product are assured.

Lion Aqua Ammonia—This product is available to manufacturers for use in the formulation of mixed fertilizers or for sale as direct application material. Normally about 30% ammonia, its content can be controlled by order to suit your needs.

Lion Nitrogen Fertilizer Solutions—Made specifically for the manufacturing of mixed fertilizers, these products supply both ammonia nitrogen and nitrate nitrogen in the ratios desired. They are easily handled and available in three types designed for varying weather conditions, and for formula requirements in the production of fertilizers that cure rapidly, store well and drill evenly.

Lion Ammonium Nitrate Fertilizer—The improved spherical white pellets in this product contain a guaranteed minimum of 33.5% nitrogen. They flow freely, resist caking and store much better. Lion Ammonium Nitrate Fertilizer is shipped in 100-pound, 6-ply bags with two moisture-proof asphalt layers.

Lion Sulphate of Ammonia—This new, superior-type sulphate is guaranteed to contain a minimum of 21% nitrogen. Through special conditioning of the larger crystals, moisture and free acid content is greatly reduced. These factors, together with the special coating applied, make for greater resistance to caking in shipment or in storage. This product flows freely. It is shipped in bulk and in 100-pound, 6-ply bags laminated with asphalt.

LION

Technical advice and assistance to fertilizer manufacturers in solving their manufacturing problems is available for the asking. Just write.

"Serving Southern States"

LION OIL COMPANY CHEMICAL DIVISION EL DORADO, ARKANSAS

This plane, shown with CAA Pilot John Paul Jones, was developed for agricultural aviation. Special features are high carrying capacity and tubing over the cockpit to protect the pilot from low wires.

Flying Farmers Meet In Memphis

Special Report Courtesy of Bill Foreman
National Cotton Council of America

This is the hopper for carrying farm chemicals just in front of the cockpit of the experimental plane being inspected by Jones and R. M. Tinney of Continental Motors Co.

AGRICULTURAL Aviation" is a phrase that probably would not occur to most people. Yet, of the more than 60 industrial uses for airplanes, more than 40 are in the field of agriculture. In 1950, over 5000 specially equipped planes in the United States spread over 350-million pounds of pesticides. Use of planes for seeding, fertilizing, and defoliation is on the increase, with new equipment, new chemicals, and new techniques appearing almost daily.

Today, 33 years after aerial agriculture's crude and precarious beginning when a researcher crawled out on the wing of a biplane and released a sack of insecticide dust over a field of alfalfa in Nevada, farming from the air is still an exacting job that calls for iron nerves, perfect reflexes and precision flying plus an expert knowledge of agriculture.

To discuss some of the problems posed by this wedding of flying to farming, more than 200 delegates gathered February 19 and 20 at the Hotel Peabody in Memphis, Tenn., to attend the third annual National Agricultural Aviation Conference.

One question that was in the minds of most of the delegates was the likely effect of the mobilization program on agricultural aviation. D. W. Nyrop, Civil Aeronautics Administrator from Washington, told the group that the CAA is submitting material to the proper government agencies so that a basis can be developed for determining non-airline uses of aircraft essential to defense. Such uses will be entitled to DO ratings for materials.

"Once these standards are approved by the government agencies concerned," said Nyrop, "CAA regional personnel will be able to issue ratings to essential users. Spraying and dusting aircraft undoubtedly will get high consideration among non-airline users."

The Wage and Hour law came

under fire at the conference, with the delegates seeking to have agricultural aviation considered as a direct agricultural function rather than an aviation activity. Contending that present application of the law is impractical and obstructive to agricultural aviation, the delegates passed a resolution urging the Administrator of the Act to revise and amend interpretations of the law as they apply to aerial cropping.

Special Plane

A specially designed agricultural airplane attracted considerable interest at the meeting. Built by Texas A and M College under a CAA contract and jointly sponsored by CAA, USDA, the Flying Farmers' Association, and Texas A and M, the plane was flown to the meeting by CAA Pilot John Paul Jones of Fort Worth, Texas.

Nyrop praised the new aircraft for its economy of maintenance, high-load carrying capacity per horsepower, and pilot-protection safety features. He said outstanding performance is expected from the plane which probably will be certificated as ready for production by April 1. Rights to make the plane, he said, will be granted to commercial concerns interested in producing it.

Coleman Speaks

Two speakers told the convention that demand for insecticides and fertilizers is greater than ever and is one of the factors behind the current tight supply situation. Dr. Russel Coleman, president of the National Fertilizer Association, said that the shortage of sulphur has placed superphosphate in critical supply. The fertilizer industry, he said, is competing with steel, synthetic rubber, petroleum and other vital industries for the limited amount of sulphur available. Dr. H. L. Haller, Bureau of Entomology and Plant Quarantine, said the outlook for insecticides in 1951 is uncertain and it is likely that supplies will be short if insect infestations are as heavy as they have been in the last two years and farmers continue to use insecticides as they have during this period.

In telling the flying farmers about the development of new insecticides, Dr. Haller said, "Aircraft are an essential part of today's farming practice. Millions of acres of our most important national resources are protected from destructive insects by insecticides released from aircraft. Crops and range lands are protected from grasshoppers, and our forests from the spruce bud-worm, the Douglas fir tussock moth, and the gypsy moth.

"Swamps are sprayed to destroy mosquitoes that carry diseases. Last spring, when the green bug threatened grain crops in the Texas Panhandle, Oklahoma and Kansas, airplanes applying the new insecticide, parathion, saved half of these crops."

Mesquite Control

In Texas, reported C. E. Fisher, superintendent of Texas Agricultural Experiment Station No. 7, more than 15,000 acres of mesquite have been effectively controlled with chemical treatments conducted on an experimental basis. The most promising treatment for large areas, Fisher said, is the airplane application of two-thirds pound of acid of a low volatile ester of 2,4,5-T in one gallon of diesel fuel and three gallons of water. In experiments in 1949, 98 per cent of the topwood was killed to ground level and 45 per cent of these plants showed no basal regrowth 18 months later. The sprout growth that did occur was short, spindly and showed abnormal development.

A list of suggested treatments for killing sand sagebrush, perennial broomweed, skunkbrush, and golden aster in rangelands was submitted by range ecologist E. H. McIlvain of the United States Southern Great Plains Field Station, Woodward, Oklahoma. The list included specific chemical treatments for each kind of plant covered in the investigation, as well as mixing instructions and methods of application of the chemicals recommended.

Oklahoma Brush Control

In Oklahoma, explained Harley A. Daniel, project supervisor, United States Soil Conservation Service, the need for controlling scrubby, woody vegetation is great. About 10-million acres in Oklahoma, he said, and about 100-million acres of range land in the Southwest are heavily infested with scrub oak, mesquite, sagebrush and other noxious plants.

Three Sprayer Types

Three types of sprayers were used to apply chemicals to control brush in Oklahoma. Powered sprayers, which seem to have their best use in spraying foliage; airblast sprayers, which have the advantage of economical use of chemicals and the action of the wind current from the blast which seems to allow better wetting of the foliage; and airplanes. Foliage treatments with aircraft the past two years have given more promising control than dormant treatments and the coarse droplets have also been more effective than the mist type. However, there are many problems to be overcome in aerial spraying. The irregularity of both the topography and the heights of woody plants makes it almost impossible to fly at a uniform distance from all the brush, and the density of the heavy tops often makes it difficult to get sufficient spray solutions on the under growth. This may call for two or three treatments over a three- to four-year period.

Research Progress

Research progress in developing chemical weed killers was described by R. H. Beatty, Ambler, Pa., agricultural research division, American Chemical Paint Company. Beatty said that thousands of compounds are screened by industry research teams each year, although only a few new chemicals ever reach the market.

Dr. J. E. Adams, head of the department of agronomy and soils, Texas A and M College, presided over a panel on fertilizing, weeding, and defoliation. Taking part in the discussion were Dr. W. H. Tharp, principal physiologist, Bureau of Plant Industry, Beltsville, Md.; R. D. Braden, department of agricultural engineering, Ohio State University; Bill Marsh, Marsh Flying Service, Phoenix,

Claude L. Welch, director of the production and marketing division of the National Cotton Council, Memphis, presided over the opening session of the third annual National Agricultural Aviation Conference, February 19-20.

Ariz.; and J. O. Dockins, Stuttgart, Ark., assistant director in charge, Rice Branch Experiment Station.

Seeding from the Air

The airplane can fertilize and seed at the rate of five to seven acres a minute. This gives it the advantages of timeliness of operation and large-scale coverage on a practical basis. This was a point stressed by Braden in emphasizing the need for greater research to develop equipment for this kind of work.

Airplanes are being used extensively for defoliating cotton, said Tharp, and he urged that operators closely follow recommendations in applying materials. Good results are being obtained, he said, in areas where large acreages of cotton are being defoliated with chemicals applied from the air.

Planes, said Dockins, have greatly improved the efficiency of rice production and are being used effectively for seeding fields, and for controlling undesirable plants. Seeding of lespedeza and winter legumes, he noted, also is a common practice in Arkansas.

W. T. Piper, Lock Haven, Pa., president of the Piper Aircraft Company, presented the National Flying Farmers' Association with a new airplane for the use of its new field secretary, Del Fuhriman, Tremonton, Utah.

E. M. Anderson, Medina, Texas, vice president, National Flying Farmers' Association, presided over the morning session on the second day of the conference. At the session, a discussion of aerial applicators was led by George Childress, Washington, chief, Aviation Extension Division, Office of Aviation Development. E. W. Hudlow, CAA official, explained that it now will be easier for operators of agricultural and industrial aircraft to modify their equipment.

The official said that CAA regulations, effective last October, will allow certification of an airplane modified for a special purpose, to be operated within the restrictions of that category. CAA approval will be made easier by on-the-spot checks by field agents and engineers of the Administration will be available to assist in installation of the more complex equipment.

Special Problems

Problems in aerial application of insecticides were discussed by Arthur Geiser, Denver, chief pilot, division of grasshopper control, Bureau of Entomology and Plant Quarantine, USDA. Also on the panel on aerial applicators were John Burke, Oklahoma City, Oklahoma Operators Association; Riley R. Whearty, Topeka, director, division of aeronautics, Kansas Development Commission, and G. R. Gaillard, Washington, Civil Aeronautics Association.

Although complete standardization of aerial application of agricultural chemicals may be "impossible," Whearty said that regulations eventually must and will achieve a high degree of uniformity at all levels. Procedures for allocating materials for agricultural operations were outlined by Gaillard; and Burke pointed out the needs of operators for these essentials.

NAC's Hart Talks

Ernest Hart, president, National Agricultural Chemicals Association was the principal speaker at Tuesday's luncheon. He declared that agricultural aviation has a pressing responsibility in the nation's defense program, particularly in helping to meet government crop goals such as that of 16-million bales of cotton. The short supply of raw materials for producing necessary pesticides, he said, places a responsibility on aerial applicators to conserve and economize on such materials wherever possible.

Controls Discussed

The final discussion on the program was concerned with insect and disease control, with Harry Smith, Lafayette, Ala., director, National Flying Farmers' Foundation, presiding, and K. Starr Chester, Columbus, Ohio, director agricultural research, Batelle Memorial Institute, panel leader. Panel participants were S. L. Calhoun, Stonevill, Miss., entomologist, Bureau of Entomology and Plant Quarantine; Arthur Geiser, BEPQ, Denver; C. R. Neiswander, Ohio Agricultural Experiment Station and Paul Lloyd, Blytheville, Ark., Planters Flying Service.

The conference, was sponsored by the National Flying Farmers' Association in cooperation with the USDA, land-grant colleges, the Civil Aeronautics Administration, the National Cotton Council of America, the National Fertilizer Association, aerial applicators, state aviation officials, state boards of agriculture, the committee of agriculture, API; and the Farm Equipment Institute. Last session before adjournment was a business meeting presided over by the National Flying Farmers' Association president, Charley Rose, of Roseland, Arkansas. ◆

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The profits of this farm and many others like it have a direct relationship to the products of our company. For successful, profit-making farming almost always calls for the wise use of the correct type of fertilizer.

Many of the most effective of these fertilizers contain potash — often Sunshine State Potash, a product of New Mexico. For potash is not only a soil nutrient, it is a crop strengthener as well. It helps to resist disease and drought, increases output, and improves conditions at time of harvest.

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HIGRADE MURIATE OF POTASH
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Modern Link-Belt Conveyors Handle Chemicals at

Florida Agriculture Supply Company

Photos and text courtesy of Link-Belt Company

FLORIDA'S weather is ideal for both people and vegetation but it also promotes the development of plant diseases and growth of insects. Consequently, scientists had to find means for controlling these pests before it was possible for Florida to reach anything like her present high degree of agricultural development.

Florida's experience and scientific developments along this line are proving very helpful to other states.

Florida Agricultural Supply Company, Division of Wilson and Toomer Fertilizer Company, with main office and plant in Jacksonville, has had a big hand in the development and manufacture of insecticides, fungicides, nutricides, dusts and sprays. Today, it is one of the largest, most completely equipped insecticide and pesticide manufacturing plants in the Southeast. Their products come in powdered or liquid form, and are marketed under the trade name FASCO.

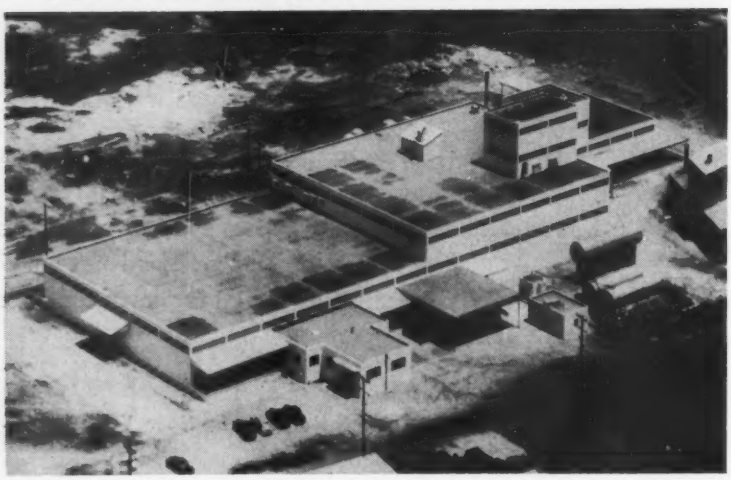
The company was formed over 30 years ago and had its head office in Orlando, but became a Division of Wilson & Toomer Fertilizer Company in 1949, with headquarters in Jacksonville.

The new plant in Jacksonville adjoins the parent company's fertilizer works but functions like an independent company. Mr. M. C. Van Horn is vice-president and manager, but our interview was mainly with Julian H. Jackson, factory manager and head of their chemical research department, whose chief aims are the improvement of product and rendering the best possible service to growers.

Built in 1948, the new FASCO plant is very efficient and has reduced hand moving of materials to a minimum. This, Mr. Jackson pointed out, is in marked contrast with how things were accomplished in the old plant.

He indicated also that the handling system had to be a very flexible one in order to allow for changing of product formulae at any time.

Below is an aerial photograph of the new plant of the Florida Agricultural Supply Company, manufacturers of a variety of pest-control formulations sold under the trade name FASCO. Plant employs materials-handling equipment installed by Link-Belt Co.



Lots to Move

Considerable material, such as bulk sulfur, clay and lime, and various bagged ingredients must be moved from one grinding, mixing and blending operation, or floor, to another.

Link-Belt elevating and conveying equipment is doing a very efficient job of mechanical handling; and so compactly are several of these units installed that it was not possible to photograph them. We refer especially to a steeply inclined 24-inch wide flat belt convevor for elevating bags of ingredients to an upper floor; and a 40-foot high steel encased centrifugal discharge bucket elevator for delivering coke to an overhead bin serving a furnace.

Bulk-Flo Conveyor

Another type of conveyor equipment they are employing is the Link-Belt Bulk-Flo, which is one of the simplest and most versatile enclosed elevating and conveying units for handling flowable granular material in a continuous mass. The conveying medium of the Bulk-Flo type of conveyor consists

of an endless chain fitted with peak-top (or straight) cross-flights at suitable intervals. The flights practically fill the entire area of the casing within which they move, forming a series of compartments that hold the material to be conveyed. Operation of chain and flights within the steel casing causes material to be conveyed to the discharge point, as indicated in accompanying cut-away view of a horizontal section of conveyor.

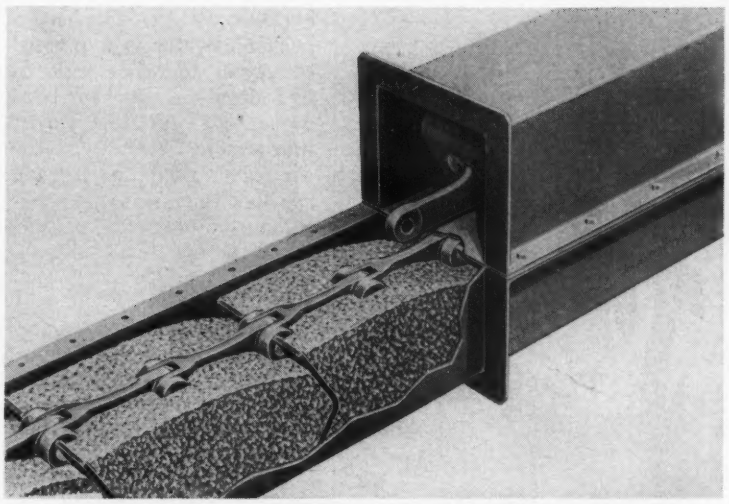
So satisfactory has been the Bulk-Flo Elevator illustrated, that in the process of mechanizing the plant's operations still further, an order for early installation of four other Bulk-Flo elevators has been placed.

Production Cycle

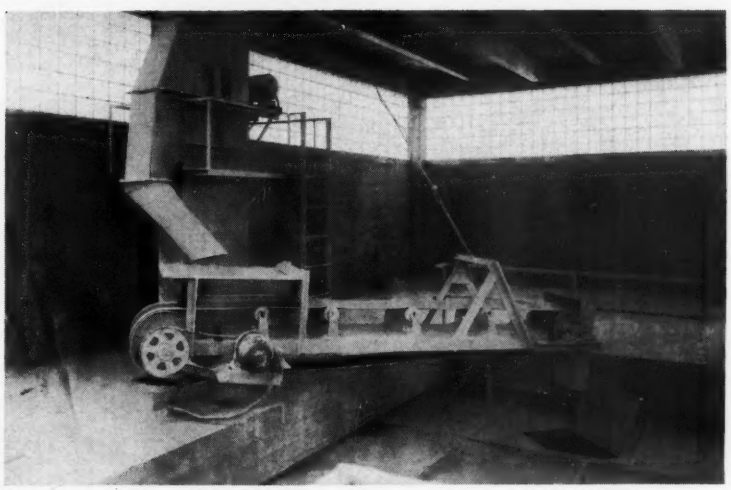
Either sulfur or clay is moved from storage outside of building by means of tractor-type scoop loader to the feed hopper of an 18-inch wide, 24-foot long inclined belt conveyor, which at a point just inside of building wall delivers to the foot of a 45-foot high vertical steel-encased centrifugal discharge bucket elevator. This in turn discharges through a pivoted chute to a two-compartment overhead storage bin. Both the clay and sulfur are taken from their respective compartments to a weight hopper, into which additional materials are added by an attendant. This weight hopper discharges (*see photo*) to a mixer below this floor. The product of mixer is fed by short 9-inch diameter screw conveyor to foot of a 40-foot high steel-encased continuous type bucket elevator. This elevator discharges the mixed material into a hopper which feeds into a Raymond mill, to be pulverized and then blown to a bag packing machine, thus completing this particular production cycle.

Second Hopper

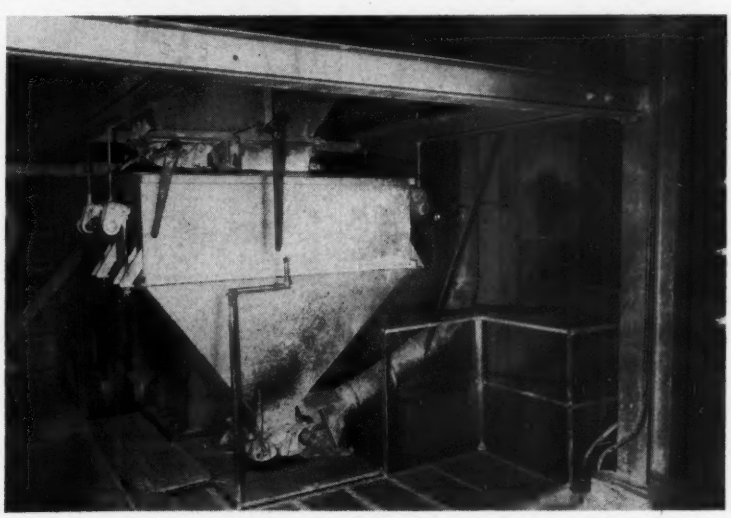
A second outside reclaim hopper is fed by payloader with either sulfur or lime. This hopper, too, feeds an 18-inch wide inclined belt conveyor. The conveyor is 36-feet long and discharges to the foot of a 64-foot high vertical steel-encased centrifugal discharge



This cut-away views construction of the chain, flights and casing, as well as the conveying principle of Link-Belt's Combined Run Bulk-Flo conveyor. Fullness of carrying portion is well displayed



Above is a 13-foot hand swung pivoted belt conveyor which transfers sulfur from head of 64-foot high vertical bucket elevator to two storage bins. Below is shown weight hopper into which material feeds from outside storage, then to mixer and screw feeder below floor and from thence into a Raymond type mill.



bucket conveyor. The head of this bucket elevator is a pivoted belt conveyor, 16-inches wide by 13-feet long, which can be hand-swung into position to deliver into either of two 50-ton capacity compartments of an overhead storage bin. One compartment is for sulfur; the other for lime.

Reclaimed by Gravity

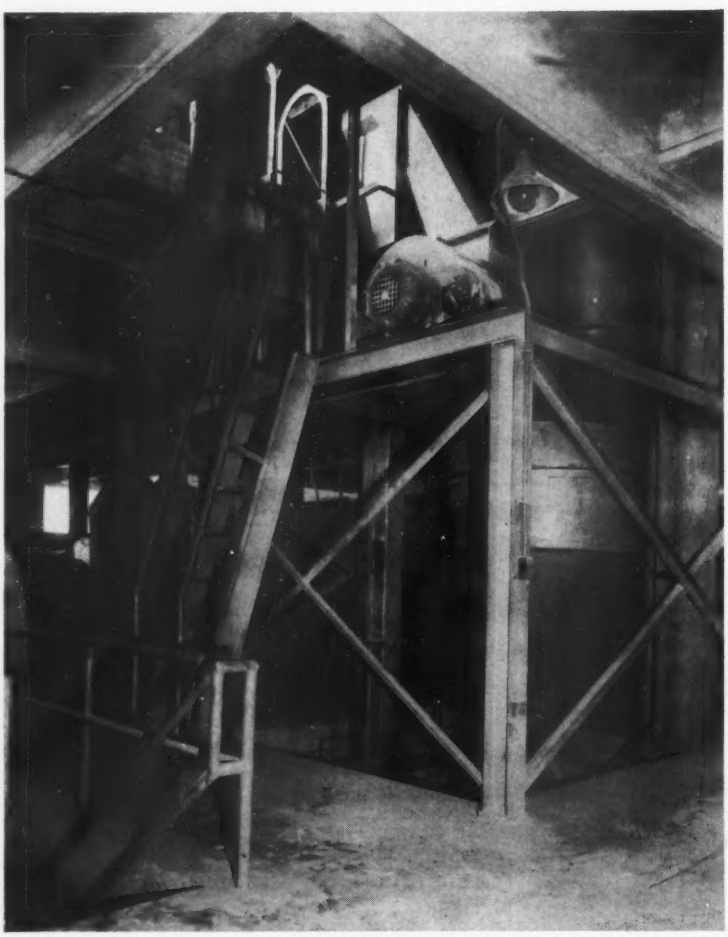
From this bin, the material is reclaimed by gravity through weight scales to two "kettles" for cooking. The liquid product of these kettles is known as calcium polysulphides and requires only straining and packaging. The sludge in the solution, a waste material at present, is dehydrated on a rotary drum dryer to facilitate disposal.

The Bulk-Flo, illustrated in two views, is a Link-Belt size No. 57 L-path self-feeding, combination conveyor and elevator, in one compact, totally enclosed power-operated unit. It has a horizontal run of 18 feet by a vertical lift of 26 feet, and is employed for handling a mixture of crushed sulfur, fuller's earth and insecticide from a hopper fed by hand from bags at an intermediate floor.

After weighing the material is delivered to the feed-hopper through a grating which excludes lumps and extraneous material. The hopper is also equipped with a sifter. This Bulk-Flo elevates the sifted material to a mixer, which discharges to a hopper feeding an automatic bag packing machine.

Information on Bulk-Flo conveyors will be found in a 48-page illustrated Book No. 2175, a copy of which will be forwarded promptly to any interested reader upon request. ◆

Head end of L-path Link-Belt elevator showing discharge chute to mixer above hopper feeding attrition mill. The elevator's horizontal run, fed through hopper at intermediate floor, is located 2 floors down.



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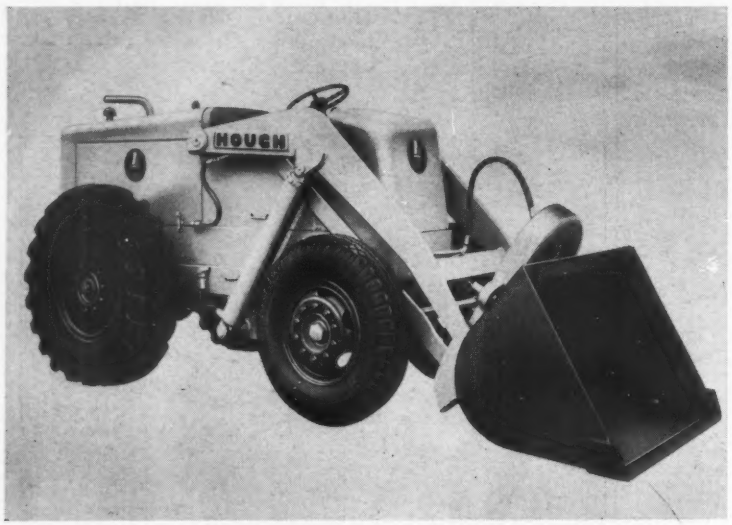
Industrial News

New Products - New Plants - New Appointments

Hough Announces New Payloader



Tractor-Shovel has quick-acting reverse control

Frank G. Hough Company has announced the latest addition to its Payloader line of tractor shovels. This new tractor shovel has a 1¼ cu. yd. bucket and is available with 60 H.P. gasoline or diesel power. Designated as the Model HY, it has a full reversing transmission giving four speeds in each direction, up to 29 miles per hour, with an independent quick-acting reverse control.

For maximum traction and capacity the engine is located at the rear of the machine over the drive wheels. The operator sits forward of the engine where he has a clear view in all directions. The manufacturer claims that nearly effortless steering is obtained because it is power boosted. Like all Payloaders it features powerful bucket crowd and an automatic bucket tip back that prevents spillage. Bucket-dump and bucket-close are hydraulic power controlled.

Large trucks according to the company may be heap-loaded because of a maximum dumping clearance of over eight feet in combination with long reach. Digging angle of the bucket can be quickly adjusted between 1 and 6 degrees. For further information about the Hough Model HY Payloader, write AMERICAN FERTILIZER AND ALLIED CHEMICALS.

Johnson Offers Bulk Storage Plants

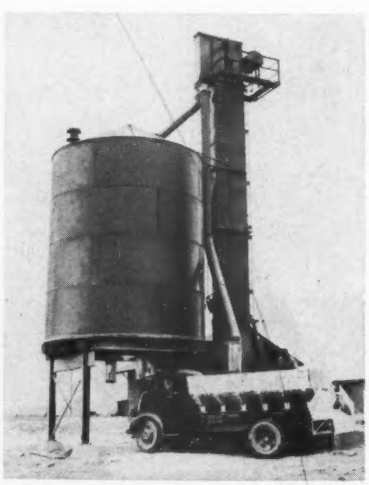
The C. S. Johnson Company is entering the agricultural chemical field with a line of special storage silos and plant equipment. A subsidiary of the Koehring Company, it is producing several sizes and types of bulk storage plants designed for materials such as phosphate, lime and potash.

One popular size of a bulk phosphate storage plant, reports the company, has a silo capacity of 160 tons (based on material weight of about 54 lbs./sq. ft.). For easy erection the single compartment steel silo features "knock-down", field-bolted construction. Diameter of the silo is 16 feet and it stands 29 feet high, not including 9-foot leg sections that are designed to provide ample truck clearance.

Two rotary plug valves at the bottom of the silo control the quantity of phosphate batched into trucks. High or low pressure air compressors with fittings around the plug valves aerate the material to counteract any arching and keep the phosphate free-flowing.

An undertrack screw conveyor receives bulk phosphate from hopperbottom railroad cars. This conveyor is electric powered and has an approximate capacity of 40 tons per hour. This capacity is synchronized with the same speeds of the chain bucket elevator. Both the conveyor and elevator are fully enclosed in weather-tight, all-welded steel casings, equipped with access doors, according to the company. A two-way gate with swivel spout located at the head of the chain bucket elevator head section will load the silo or d vert the flow of material into a silo by-pass chute. This arrangement allows the operator to fill trucks directly from the rail car. The two-way gate allows installation of a second silo as additional facilities are needed.

The company claims that advantages include one man handling, savings in warehouse or yard space, and the assurance of an adequate supply of material to meet heavy seasonal purchases. More information can be obtained by writing to the AMERICAN FERTILIZER AND ALLIED CHEMICALS.



Bulk storage plants like this may ease seasonal demands for fertilizers. Silo is made of steel and has electric powered bucket elevator

Davison To Produce Granulated Complete Fertilizers

The production of homogeneous granulated complete fertilizers by the Davison Chemical Corporation will begin soon on a limited basis. The company said that the new process is still on a test and development basis. Extension to other plants is well in the future and the prospective production is already completely sold out for the season.

In homogeneous granulated complete fertilizers the fertilizing materials are combined in small pellets or granules, each of which contain the ingredients in proper proportion. The company explains that in this form the fertilizer feeds freely and evenly from the farmer's machinery and can be applied without loss from blowing even when airplane distribution is used.

Fertilizers produced in this form resist caking, Davison reports, and can thus be produced and stored in the season of minimum demand for fertilizers. When applied to the soil the fixation of the phosphate ingredient is said to be less than when placed in the pulverized form. This type of fertilizer has been used extensively abroad and more than three-fourths of the complete fertilizers produced in Great Britain are granulated.

Pennsalt Develops New Process

A NEW PROCESS for the uniform impregnation of DDT-benzene hexachloride dusts has been developed by the Pennsylvania Salt Manufacturing Company, it was announced. The new process is now in use at Pennsalt's new insecticide formulating plant which recently went into operation at Montgomery, Ala., and in the plants of several customer formulators who use Pennsalt's technical DDT and 36 per cent gamma isomer BHC.

The process is based on the fact that when technical DDT and Pennsalt's 36 per cent gamma isomer BHC are blended in a certain proportion, the resulting combination has a lower melting or setting point than either of the two melted separately. The resulting liquid can be blended with the diluent so that virtually every particle carries some of the active ingredient, in contrast with mechanical mixtures.

The process was developed by Pennsalt's Research and Development Division and process equipment was designed by the company's Central Engineering Department. While the company is using the process in its own formulating plants, it is also being made available to other formulators.

Fertilizer Tag Sales Still Increasing

Tax tag sales reached a new high during 1950. Tags representing the sale of nearly 11 million tons of fertilizer were reported, an increase of better than a million tons over the figure reported for 1949. Sales during 1950 reached 10,877,974 tons as compared with the 9,808, 154 tons reported during 1949.

Reports from fourteen states for the first month of 1951 indicate that sales are still on the increase. January, 1951, sales in these states were 68 per cent greater than in January, 1950. A sales increase of over a quarter of a million tons of fertilizer was reported from eleven southern states and three midwestern states indicated a total gain of 124,185 tons.

FERTILIZER TAX TAG SALES AND REPORTED SHIPMENTS
(IN EQUIVALENT SHORT TONS)
COMPILED BY THE NATIONAL FERTILIZER ASSOCIATION

State	*January*		*January-December*		*July-December*	
	1951	*1950*	*1950*	*1949*	*1950–51*	*1949–50*
Virginia	....	....	670,330	682,415	158,548	188,428
North Carolina	....	....	1,816,079	1,518,457	391,285	257,571
South Carolina	188,934	157,950	1,013,826	962,716	308,211	200,144
Georgia	256,009	149,329	1,235,758	1,233,635	279,453	217,213
Florida	153,475	122,023	1,097,368	984,092	527,220	468,629
Alabama	56,425	41,839	1,051,309	1,042,369	227,014	165,517
Tennessee	21,132	16,084	492,256	461,775	119,518	101,043
Arkansas	34,994	16,915	366,063	334,595	75,933	67,418
Louisiana	43,161	19,631	278,708	241,589	74,227	56,444
Texas	61,480	40,354	587,639	505,497	256,109	215,649
Oklahoma	....	....	143,920	125,528	55,608	54,518
Total South	815,610	564,125	8,753,256	8,092,668	2,473,126	1,992,574
Indiana	127,610	98,375	961,653	770,739	496,164	405,419
Kentucky	94,782	57,415	607,170	490,716	207,763	166,047
Missouri	135,087	77,504	555,895	454,391	263,180	167,984
Total Midwest	357,479	233,294	2,124,718	1,715,846	967,107	739,450
Grand Total	1,173,089	797,419	10.877,974	9,808,514	3,440,233	2,732,024

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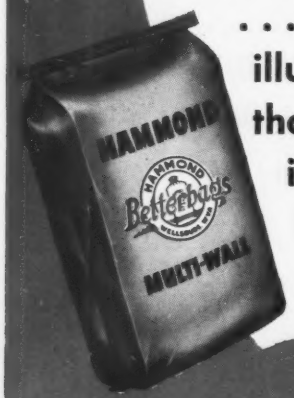

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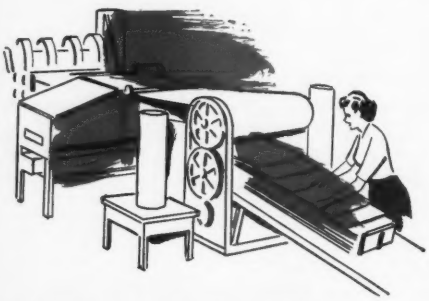

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Brooks Joins Commercial Solvents Corporation

Dr. James W. Brooks has joined the Agricultural Chemicals Division of Commercial Solvents Corporation in charge of feed, insecticide, and fertilizer sales in the Central States. He will make his headquarters at the Terre Haute office of the company.

Dr. James W. Brooks

Prior to joining Commercial Solvents, Dr Brooks was Manager of the Agricultural Chemicals Division of N. S. Koos and Son Company. He has had extensive sales and research experience in the feed, insecticide, and fertilizer fields, including state experiment station work. During the war, Dr. Brooks was in charge of a malaria unit of the Sanitary Corps in the Pacific.

A graduate of the University of Wisconsin with a Ph.D. in economic entomology, Dr. Brooks is the author of more than a dozen papers, principally on the subject of chemical control of insects.

Link Belt Issues New Catalog

Link-Belt Company has started distribution of its new 1,296-page catalog. Designed to give some relief from engineering manpower shortages the eight-pound book has been three years in preparation. Identified as Link-Belt General Catalog 900, it is being distributed to industrial and engineering firms, engineering schools, and libraries.

The book presents basic engineering data designed to facilitate the selection of chains and wheels, drives, power transmission elements, conveyors and process machines in combinations which will serve a wide range of requirements and conditions. To simplify problems of design, 1,673 tables and charts of pertinent data are included.

Virginia-Carolina Announces Changes in Staff

E. Y. Bass of Richmond, Va., has been named assistant to the vice-president in the general sales office of the Virginia-Carolina Chemical Corporation's Fertilizer Division. At the same time the concern announced that John L. French has been transferred to Richmond as assistant general sales manager of the Fertilizer Division. W. D. Barton will succeed French as manager of the Shreveport, La., office.

Bass first joined the organization in 1910 as a member of the manufacturing department in Durham, N. C. Three years later he was transferred to Richmond. He then was assigned to the company's sales department and was appointed assistant general sales manager in November of 1949. He remained in this capacity until his present appointment.

E. Y. Bass

A native of Byhalia, Miss., French first became associated with V-C at the Memphis, Tenn., sales office in 1927. He held various positions in that office and in 1946 was sent to Shreveport as manager of the company's office in that city.

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are the farm families throughout the nation who buy your products. Many of their production needs are closely related to yours.

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Industrial News

Davison Director Elected to Trust Company Board

R. L. Hockley, vice president and a director of the Davison Chemical Company, has been elected a Director of the Safe Deposit and Trust Company of Baltimore. He is a member of the American Society of Refrigerating Engineers, American Management Association, National Federation of Sales Executives and other organizations. Hockley is also on the Board of Directors of United States Hoffman Machinery Corporation and is an active participant in Baltimore civic affairs.

Mr. Hockley has been associated with the Davison Company since 1934 and was named vice president in charge of the Marketing Division in 1942. It has been one of his responsibilities in recent years to implement the policy of Davison to diversify into new chemical fields.

Wanted: Assistant Superintendant for fertilizer plant by old established Ohio manufacturer. Age, preferably, between 30 and 40 years, with knowledge of production and maintenance work. When replying give experience, reference and approximate salary expected. Address "335" care AMERICAN FERTILIZER AND ALLIED CHEMICALS, Philadelphia 7, Pennsylvania.

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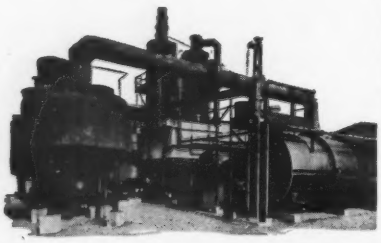

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Mathieson Subsidiary Plans a New Chemical Plant

A new wholly owned subsidiary of Mathieson Chemical Corporation, the Mathieson Alabama Chemical Corporation, will build a chlorine and caustic soda plant near Mobile, Ala. Both chemicals are reported in short supply and are vital to the mobilization program.

Salt from the McIntosh Salt Dome to supply salt brine, a necessary raw material for the manufacture of chlorine and caustic soda. Preliminary drilling operations on the dome have already been carried out.

Engineering for the new plant has already been completed. A 500- to 1000-acre site at McIntosh, 40 miles north of Mobile, will be utilized. It is expected that the new plant will be in operation by early 1952 and will use the Mathieson Stationary Mercury Cell process. In this method the brine pumped from the wells is broken into its component elements, sodium and chlorine, by passing a direct current through it in a specially designed electrolytic cell. Mathieson expects that all production of the plant will be utilized in the Gulf Coast area.

Canadian Plant To Produce Sulfur and Sulfuric Acid

Elemental sulfur and sulfuric acid will be produced at a $4,000,000 plant to be erected by Noranda Mines, Ltd., Toronto, Canada. Several sites are being considered and one is expected to be chosen soon.

Noranda reports that the new plant will process about 300 tons of pyrite daily to produce 150 tons of sulfur of which one-third will be in elemental form and the balance sulfuric acid. It is expected that the process will also produce approximately 100 tons of sinter iron per day.

26th Annual NFA Convention

Hotel reservation forms are now available from the National Fertilizer Association, 616 Investment Building, Washington 5, D. C., for their twenty-sixth annual meeting to be held June 11–13 at the Greenbrier in White Sulphur Springs, W. Va. The forms, when filled out, should be sent directly to the hotel. The hotel management has requested that a separate form be used for each reservation desired.

1950 Potash Deliveries at All-Time Record High

Potash salts amounting to 2,579,085 tons containing an equivalent of 1,465,599 tons of K_2O were delivered in North America during 1950 to set a new record. This was an increase of 28 per cent or 319,806 tons of K_2O over 1949. Imports also were up, 210,381 tons K_2O were shipped in, the greatest amount since 1938.

Deliveries for agricultural purposes within the United States were up 291,965 tons K_2O over 1949 as 1,264,119 tons went out. Forty-six states and the District of Columbia received potash shipments with Illinois and Ohio leading in amounts shipped in at 100,000 tons K_2O each. Shipments to Canada, Puerto Rico, Cuba, and Hawaii totalled 1,368,939 tons as other countries received 16,313 tons K_2O.

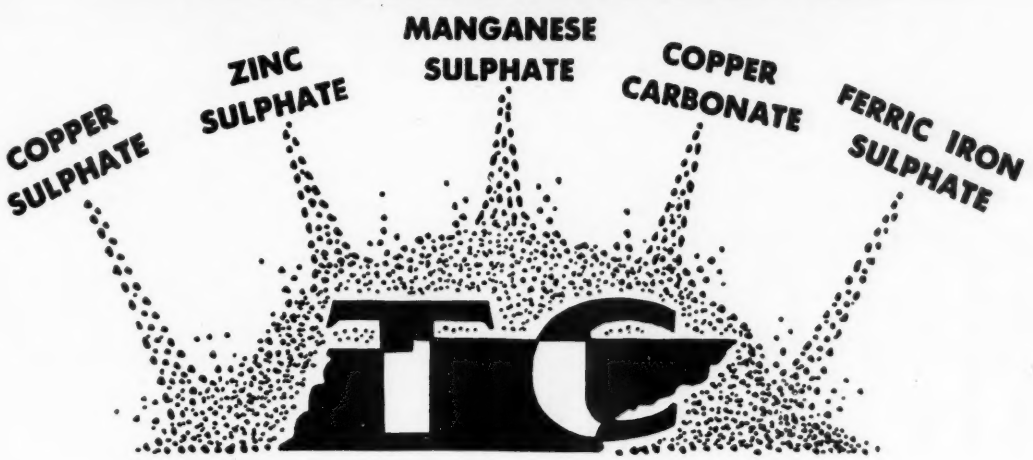
Sixty per cent muriate of potash continued to be the most popular material accounting for 79 per cent of the total K_2O delivered for agricultural purposes. Fifty per cent muriate made up nearly 13 per cent, manure salts less than 1 per cent, and sulphates of potash and potash magnesia 8 per cent. Use of manure salts has declined with the increased refining capacity produced and the demand for the more concentrated forms of potash.

Deliveries for chemical purposes in 1950 totalled 80,347 tons K_2O or an increase of 21 per cent more than in 1949.

Bags in Short Supply

Bemis Bro. Bag Company reports that fertilizer manufacturers may have difficulty in securing bags during 1951. Increased demand for multiwall paper bags is expected from *(see page 32)*

Mineral Salts



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For further information write the Tennessee Corporation, Grant Bldg., Atlanta, Georgia or Lockland, Ohio.

TENNESSEE TC **CORPORATION**

Atlanta, Georgia — TENNESSEE CORPORATION — Lockland, Ohio

(*from page 30*) many industries. Containers of this type constituted 85 per cent of the fertilizer industries' requirements in 1949 and 1950. Multiwall bag users were operating on short inventory before the Korean war and now production backlogs are so large that some manufacturers have set up allocation systems.

Burlap bags are also in short supply. Most burlap supplies are obtained from Indian mills but the raw jute is grown in Pakistan. Difficulties between these countries have reduced the flow of the raw material to the mills. Further reductions may come in the future.

Manufacturers are pushing the use of new cotton sheeting fertilizer bags. They claim these containers combine good appearance, and strength with serviceability. A paper band encircles the bag permitting the use of advertising, instructions, trade mark and additional data the fertilizer manufacturer might wish to place on his package. After use the band can be removed, the bag washed and used by the farmer or housewife.

New Pennsalt Bulletin on DDT Tree Sprays

A new service bulletin has been issued by the Pennsylvania Salt Manufacturing Company. The booklet describes safe methods of spraying shade and ornamental trees with DDT emulsion concentrate.

Designated as Pennsalt No. 201 bulletin it lists in tabular form a list of host trees, insect pests as well as the spray to be used and instructions on application. A copy may be obtained by writing AMERICAN FERTILIZER AND ALLIED CHEMICALS.

Barrett Re-opens Office

Allied Chemical & Dye Corporation's Barrett Division has reopened its service office in the Carolina Life Building at Columbia, S. C. The new office will handle service work in connection with Arcadian, the American nitrate of soda, A-N-L brand fertilizer compound and other nitrogen materials distributed by Barrett for application in South Carolina. Barrett's Columbia office will also direct the technical service for nitrogen solutions and mixed fertilizer production in the state.

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In addition to serving as America's leading distributor of Nitrogen, Barrett also functions as a technical service bureau.

Many of Barrett's activities are educational and advisory in character.

In the fertilizer field, Barrett technical men are in constant contact with fertilizer factory superintendents, assisting them in formulation problems.

Barrett's skill, experience and "*know-how*" have helped to develop the technology of manufacturing better fertilizers.

In the agricultural field, Barrett cooperates with state and federal departments. For a generation, Barrett has been conducting on-the-farm tests and demonstrations, to aid in determining the most efficient use of Nitrogen on various crops and soils.

From time to time, Barrett has established fellowships at agricultural colleges for similar purposes.

Results and information obtained from these sources and activities are communicated to thousands of farmers by Barrett, through the use of many forms of educational material.

Barrett's 61 years of progress in the development of American-made Nitrogen are a record of *SERVICE*.

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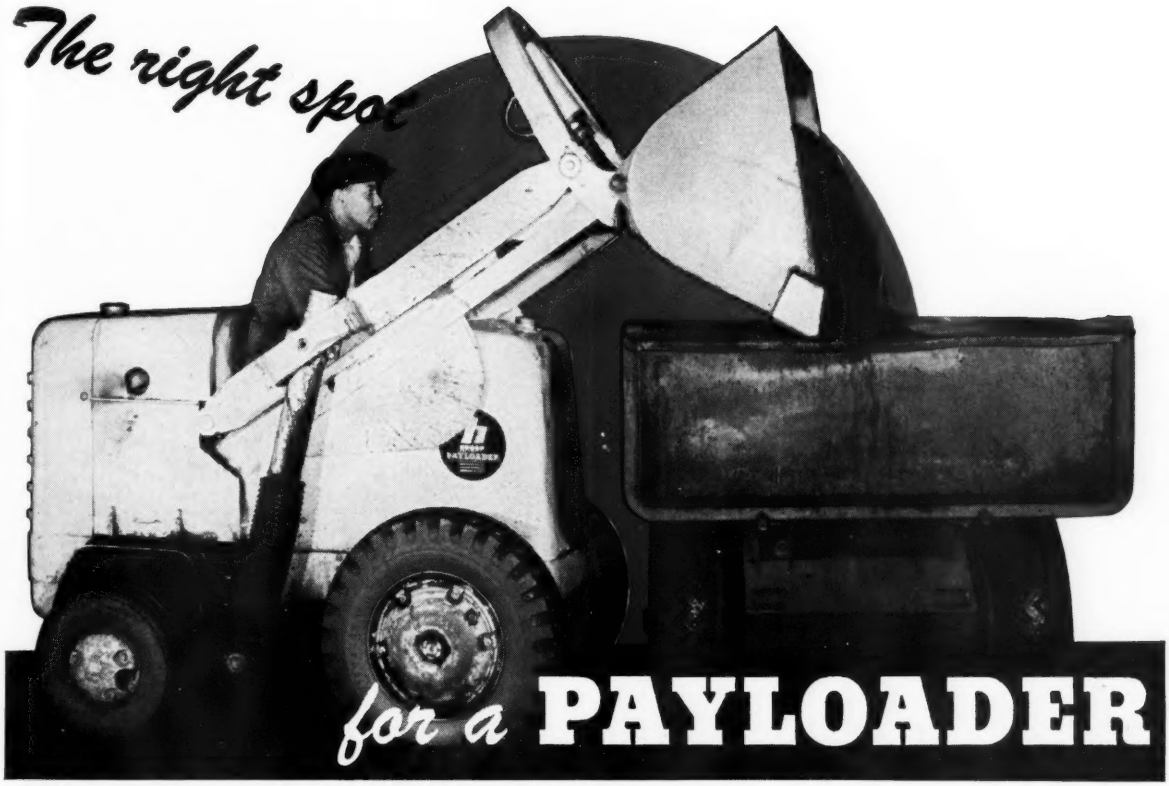

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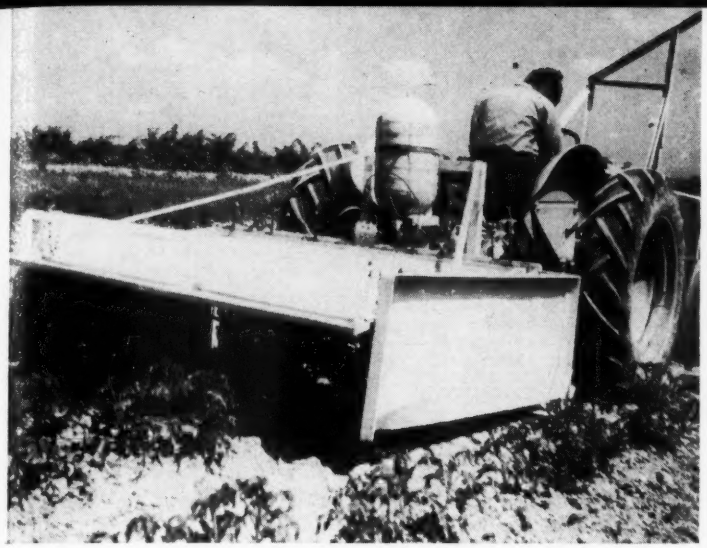


This tractor-mounted liquified gas aersol dispenser was used in the experimental work conducted on bean beetle control on the Maryland Experment Station's Horticultural Farm.

Chemical Methods for Controlling the Mexican Bean Beetle

L. P. Ditman and W. E. Bickley
Maryland Agricultural Experiment Station

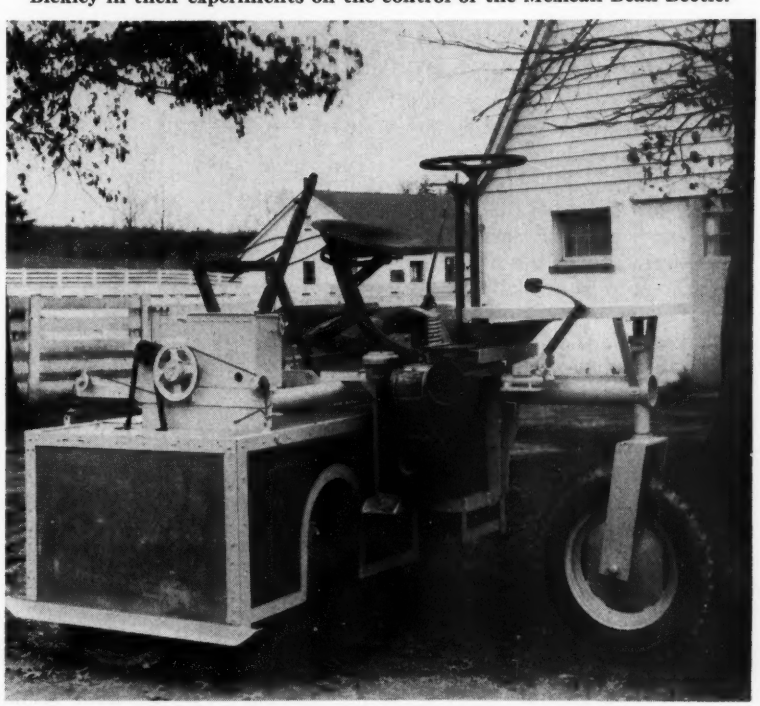
RECOMMENDATIONS for the insecticidal control of the Mexican bean beetle have never been unified or stabilized over a very long period of time. This has been a result of a rapidly changing insecticide situation. Early experimental work and subsequent recommendations involved the then popular arsenicals, magnesium, zinc, and basic copper arsenate for spraying, and calcium arsenate with lime and copper sulphate for dusting. The arsenicals were followed by the fluosilicates. Just before World War II the rotenone-containing insecticides became popular. Since then a number of newer synthetics have been tested against the bean beetle, only one of which, parathion, has come into wide commercial use.

During this period considerable field work has been done at the Maryland Station. Because much of this work has not been published, some of the most notable results are mentioned here.

About 1940 some tests were made with concentrated and high-gallonage sprays; the highest kills of beetle and highest yields of lima beans were secured with a low gallonage spray of pyrethrum. When the amount of pyrethrum recommended per 100 gallons of water was applied in 12 gallons of water at 12 gallons per acre there was a rapid and high knock-down of adults and larvae which did not recover as they do from high gallonage sprays. Sprays were also found to be rather satisfactory on relatively young plants, but on nearly mature heavy-vined plants neither high nor low gallonage sprays gave foliage coverage equal to that obtained by dusting.

For several years tests were conducted with various concentrations of derris and cube dusts, some of the fluosilicate dusts, and the 20–20–60 calcium arsenate-copper-lime dust. In this work the most nearly complete control of the Mexican bean beetle was obtained with .75 per cent rotenone compound from ground derris root. In fact, no other insecticidal dust, spray, or aerosol then or since has

This machine is a self propelled liquified gas aerosol dispenser built for both experimental and commercial use and employed by Ditman and Bickley in their experiments on the control of the Mexican Bean Beetle.



given results in our tests equal to those obtained with derris dust.

During the past war and post-war period commercial bean beetle control with available cube dusts has not been consistent, and in many instances was unsatisfactory even with repeated applications. In restricted areas where successive crops of beans were grown there was a general seasonal build-up of the beetle population despite heavy and repeated dusting. It is because of this condition that rather intensified work on bean beetle control is being carried on at the Maryland Experiment Station.

During the past few years considerable work has been done with some of the more promising bean beetle insecticides applied as water sprays, dusts, and liquefied gas aerosols. Perhaps some 50 aerosol formulations of pyrethrum, derris, and cube extracts, methoxychlor, parathion, and other poisons in various combinations and concentrations, with and without synergists and with various solvents, have been tried. Some of the more promising formulations have been used in commercial applications. The most satisfactory results were secured with a 2 per cent parathion aerosol, but it has not been recommended for general use because of its extreme danger to machine operators. Parathion is extremely toxic to man in aerosol form, much more so than in dusts or sprays of wettable powder. Aerosols, like water sprays, are much more effective when applied to younger bean plants; adequate coverage is difficult to obtain on large plants.

The experimental work of the past 2 years is of particular interest because it includes observations on the performance of the now-available or soon-to-be-available insecticides that look promising for bean beetle control. The results of this work are summarized in Tables 1, 2, and 3 and will be published in detail in an early issue of the *Journal of Economic Entomology*.

All aerosols used in these tests contained 50 per cent methyl chloride as a propellant and either acetone or methylene chloride in addition to the ingredients given in the tables. Also it probably should be pointed out that the "per cent reduction" in Tables 1 and 2 refers to a compar- (*see page 38*)

TABLE I

Treatments	Per cent reduction of larvae	Total pounds shelled beans
No treatment	**19.9**	**524**
Aerosol: 2% parathion 10% xylol	**85.1**	**470**
Aerosol: 2% parathion 10% Velsicol AR-60	**63.3**	**538**
Dust: .05% pyrethrins .25% rotenone .5% n-propyl isome[1]	**97.3**	**600**
Dust: 1% parathion	**81.2**	**574**
Aerosol: .5% rotenone	**65.8**	**499**
Aerosol: .5% pyrethrins	**25.6**	**522**

(1) Di-n-propyl maleate-isosafrole, obtained from S. B. Penick and Company, N. Y.

TABLE II

Treatments	Per cent reduction		Total yield pounds
	Larvae	Adults	
Aerosol: 1.5% Dilan[1]	**39.7**	**72.0**	**59.7**
Aerosol: 2% 4049[2]	**29.2**	**0**	**68.0**
Aerosol: 2% 4124	**0**	**31.2**	**58.5**
Aerosol: 5% n-propyl isome.	**0**	**0**	**50.2**
Aerosol: 2% parathion 10% xylol	**67.1**	**42.9**	**58.2**
Aerosol: .5% rotenone 5.0% methoxychlor	**24.8**	**0**	**54.0**
Dust: .05% pyrethrins .25% rotenone .5% n-propyl isome.	**93.4**	**42.1**	**59.5**
Dust: 1% parathion	**56.2**	**68.7**	**58.5**
Dust: .75% rotenone	**63.5**	**81.8**	**67.2**
Spray: 50% 4049 emulsion 1 pt./100 gal.	**30.2**	**47.3**	**49.0**
Spray: 25% 4049 wettable powder, 1 lb./100 gal.	**0**	**61.9**	**41.2**
Spray: 25% 4124 emulsion 1 pt./100 gal.	**0**	**0**	**51.7**
No treatment	**6.3**	**27.7**	**57.0**

(1) "Dilan," obtained from the Commercial Solvents Corp., N. Y., contained a mixture of 2-nitro-1, 1-bis (p-chlorophenyl) propane and 2-nitro-1, 1-bis (p-chlorophenyl) butane.

(2) Compound 4049: s-(1–2, -dicarbethoxyl) 0, 0-dimethyl dithiophosphate; compound 4124: o-(2-chloro-4-nitrophenyl) 0, 0-dimethylthiophosphate, furnished by the American Cyanamid Co., N. Y.

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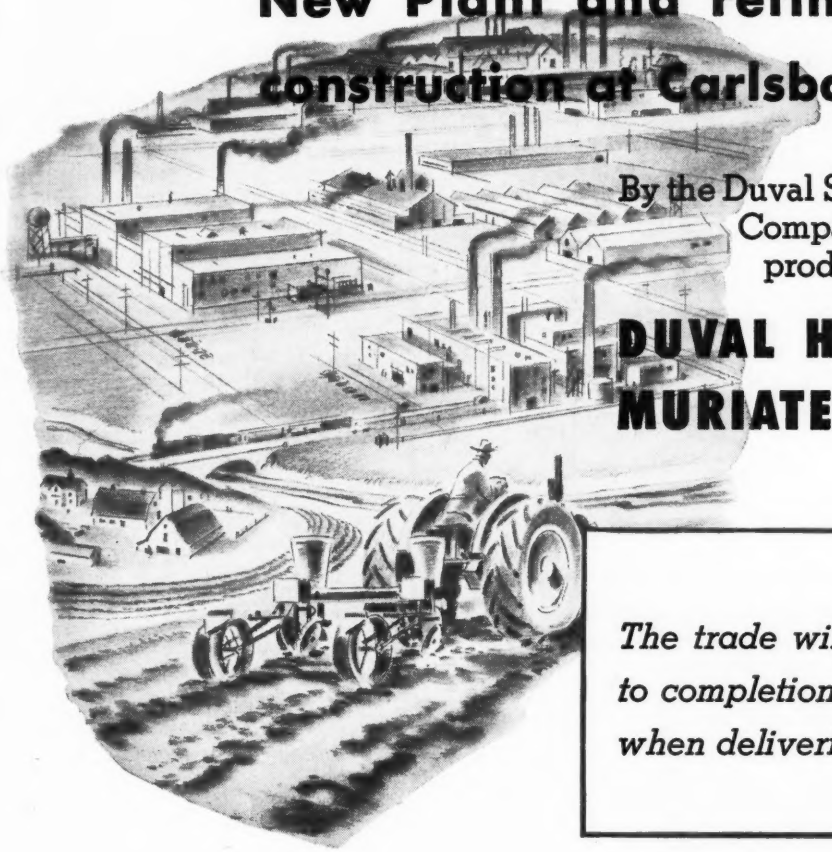

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DUVAL POTASH FOR BETTER PRODUCTS OF FARM AND FACTORY

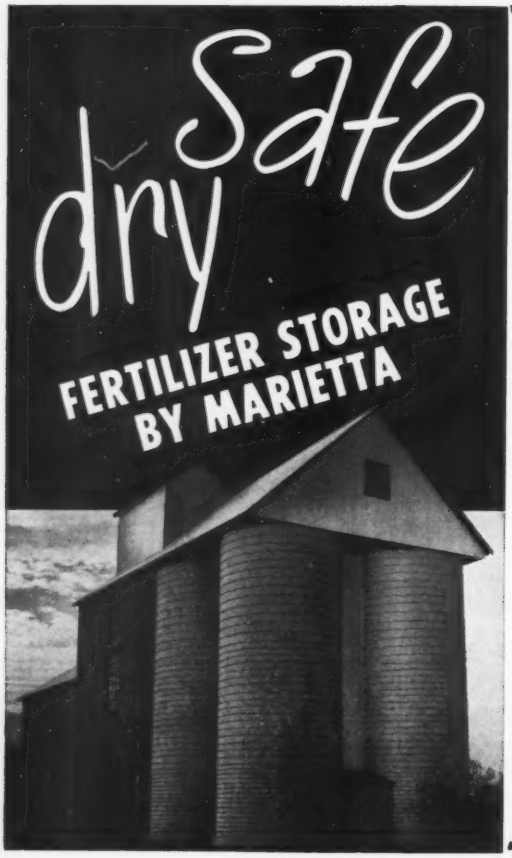
Treatments	Per cent control		Per cent reduction of injured pods
	Larvae	Adults	
Aerosol: 1.5% Dilan	99.6	81.5	83.6
Aerosol: 2% 4049	92.0	88.9	70.4
Aerosol: 2% 4124	0	48.1	35.8
Aerosol: .5% rotenone 2% n-propyl isome..	56.3	48.1	64.2
Aerosol: 2% parathion 10% xylol	96.2	70.4	79.2
Aerosol: 5% rotenone 5.0% methoxychlor	72.8	63.0	62.3
Dust: .05% pyrethrins .25% rotenone .5% n-propyl isome..	99.2	96.0	84.3
Dust: 1% parathion	99.2	100	69.2
Dust: .75% rotenone	100	85.2	88.1
Spray: 50% 4049 emulsion 1 pt./100 gal.	99.2	96.3	72.3
Spray: 25% 4049 wettable powder, 1 lb./100 gal..	87.4	81.5	61.6
Spray: 25% 4124 emulsion 1 pt./100 gal.	5.4	44.4	48.1

Table III. This tabulation shows the results of 1950 tests on Mexican bean beetle control on snap beans. Table II (page 36) shows tests on Fordhook lima beans, and Table I gives results of 1949 tests on Triumph lima beans.

(*from page 36*) ison of population estimates before and after treatments, while "per cent control" in Table 3 refers to a comparison of treated and check plots after treatments were made.

Of the various insecticides tested, the pyrethrum-rotenone-synergist dust gave the best results both on yields (Table 1) and on reduction of the adults and larval populations. When repeated applications were made, the straight .75 per cent rotenone and the 1 per cent parathion dusts performed quite well. Of the newer insecticides, compound 4049 and Dilan show considerable promise, particularly in the aerosol formulation; however, more information is needed on dosage and concentration of these two toxicants.

It is the opinion of the authors that none of the treatments used gave the degree of bean beetle control desired when only one application was made. Repeated treatments of the best performing materials are needed to give satisfactory control. ◆



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FERTILIZER MATERIALS MARKET

New York

March 8, 1951

Sulphate of Ammonia

With the producers sold out for the balance of this season, offerings were hard to locate and demand excellent. Shipments were moving well against contracts. Exporters were unable to locate sizeable offerings.

Nitrate of Soda

This material is reported moving well particularly in the South. So far no shortage has been reported.

Ammonium Nitrate

Demand continues excellent for this material and producers feel they could sell a great deal more of this material if it were available. Shipments are going forward on contract.

Nitrogenous Tankage

Domestic producers are still sold out for the balance of this fertilizer season. Offerings are scarce and most buyers are being forced to use substitute materials wherever possible. Little imported material has arrived recently.

Castor Pomace

This material is entirely sold out for the next 60 days with no material offered. Last sales were on the basis of $5.50 per unit of ammonia ($6.68 per unit N), f.o.b. production points. The demand was heavy.

Organics

Vegetable meals have shown a slightly easier tendency pricewise in the past week, due to lack of buying mainly from the feed trade. Linseed meal sold at $70.00 per ton in bulk, f.o.b. Eastern production points, and some soybean meal sold at $69.00 per ton, f.o.b. Decatur, Ill. in bulk for quick shipment. Cottonseed meal remained firm, due mainly to lack of offerings. Tankage and blood were steady with last sales of tankage made at $9.00 per unit of ammonia ($10.94 per unit N), f.o.b. Eastern points, and blood sold at $9.50 ($11.55 per unit N). Other organic materials used by the fertilizer trade were firm in price, due to seasonal demand.

Fish Meal

Offerings of menhaden fish meal for quick shipment were a little hard to locate but numerous offerings of imported fish meal were obtainable for nearby shipment. Fertilizer buyers were showing little interest in this market, due to present high prices.

Bone Meal

Offerings of this material were difficult to locate both for fertilizer and feed use. Little imported material has been arriving of late and the shortage is expected to last for the balance of the fertilizer season.

Hoof Meal

Few offerings were noted of this material with last sales made on the basis of $7.75 per unit of ammonia ($9.42 per unit N), f.o.b. Chicago.

Superphosphate

There was a definite shortage of the regular superphosphate in some Southern sections and a good many producers were behind on deliveries due to the sulphur and sulphuric acid situation. Triple superphosphate is definitely short with producers trying to stretch available supply as far as possible.

Potash

No further offerings of foreign material are reported and demand continues heavy with producers shipping against contracts and at times having difficulty in obtaining necessary freight cars. Some imported sulphate of potash recently arrived.

Philadelphia

March 8, 1195

The extreme shortage of sulphuric acid is having its effect on sulphate of ammonia and superphosphate production. These materials are in tight supply and are gradually falling behind requirements. No easement is expected until after the spring season. Supplies of all forms of chemical nitrogen are becoming tighter, and while blood and tankage are still in ample supply, they are holding up in price. Potash is not yet seriously short.

Sulphate of Ammonia.—Coke-oven grade is in tight supply and the synthetic grade practically out of the market, due to sulphuric acid scarcity. A few offerings of resale coke-oven grade have reached the market at $55.00 to

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SHEEP—COW—POULTRY MANURE
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Ammonium Nitrate.—Demand is very active, but the supply is tight and production entirely under contract.

Nitrate of Soda.—There is a greatly increasing demand and stocks are no longer in abundance. Present requirements are just about being met.

Blood, Tankage, Bone.—Blood is steady at $9.50 per unit of ammonia ($11.55 per unit N), and not too plentiful. Tankage holds firm at $9.00 to $9.50 per unit ($10.94 to $11.55 per unit N), and bone meal is strong at $65.00 to $70.00 per ton. Hoof meal is nominal at $7.75 per unit of ammonia ($9.42 per unit N).

Castor Pomace.—There are no offerings in the open market at this time.

Fish Scrap.—Menhaden meal is quoted at $140.00 per ton with not much interest shown by buyers. Unground scrap is quoted at $130.00.

Phosphate Rock.—Shipments are reported meeting requirements and no shortage of supply.

Superphosphate.—Supply is short due to scarcity of sulphuric acid, and production is mainly under contract.

Potash.—Production is well sold ahead and is moving at full capacity. There was some shipping delay occasioned by shortage of bags, but this is being gradually adjusted. Demand continues strong.

Charleston

March 7, 1950

All prime ingredients such as nitrogenous, superphosphate and potash continue in heavy demand which is in excess of available supplies; most manufacturers expect the tight supply situation to continue through 1951.

Organics.—Organic fertilizer materials are in strong market position with active demand and supplies limited. Packing house products continue too high in price for most fertilizer users. Domestic nitrogenous tankage producers are in a practically sold-up position with the market nominally $4.35 to $6.00 per unit of ammonia ($5.29 to $7.29 per unit N), in bulk, f.o.b. production points.

Castor Pomace.—Demand is fair, but all producers of domestic material are sold up through April. Last price paid was $5.50 per unit of ammonia ($6.68 per unit N), in bags, f.o.b. Northeastern production points for material testing minimum 5.75 per cent ammonia.

Dried Ground Blood.—Both the New York and Chicago markets are at levels approaching the ceiling prices of $9.25 to $9.50 per unit of ammonia ($11.24 to $11.55 per unit N), in bulk.

Potash.—Although the deliveries during 1950 amounted to approximately 28 per cent more than the preceding year, there still remains a strong demand for potash. Movement is in steady volume with bagged material slightly behind schedule, due to lack of sufficient bags.

Ground Cotton Bur Ash.—Sources of this excellent potash, high in carbonate of potash, are able to take orders for prompt and spread March/April/May shipment. This material analyzes 30/40 per cent K_2O with most analyses close to 40 per cent. Prices continue firm.

Phosphate Rock.—Shipments, as required are going forward promptly with cut-backs in demand dependent upon acidulators' supplies of sulphuric acid.

Superphosphate—Triple superphosphate is in excessive demand in relation to supply and no surplus is available. Normal superphosphate also is in very tight market position.

Sulphate of Ammonia.—This market is now quite tight and some producers are slightly behind on shipping schedules due to difficulty in obtaining sulphuric acid.

Ammonium Nitrate.—Output remains heavily under contract with demand active and the supply position quite tight.

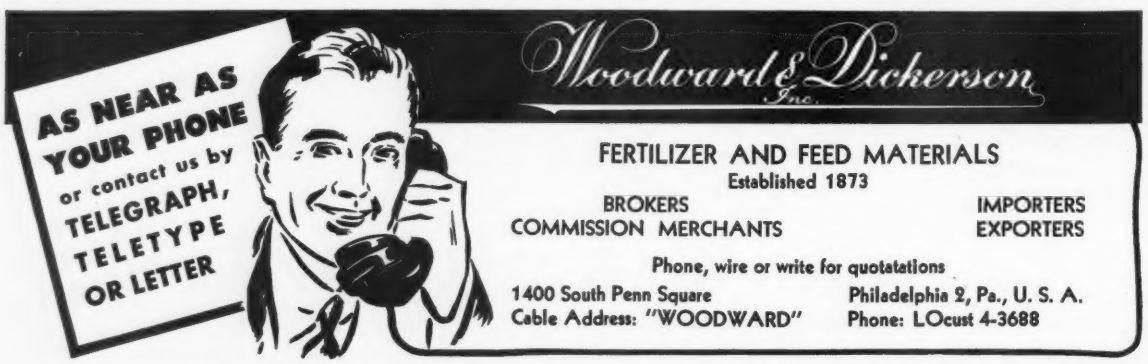
Nitrate of Soda.—There are no surplus stocks available at present. Demand is far in excess of supply with shipments expected to be approximately the same as during 1950.

◆

Monsanto's Annual Report on Income

Monsanto Chemical's annual report mailed to stockholders last month listed a net income of $26,220,333 after Federal income taxes for the year and excess profits tax for the last six months had been deducted. This amounted to $5.37 a common share as compared with $3.74 a common share earned in 1949. Effective with the December 1 dividend payment the company increased the annual dividend rate on common stock from $2.00 to $2.50 a share and added a $.50 extra dividend. Total sales, excluding those of its British and Australian subsidiaries, totalled $227,135,206.

A low 1.80 lost-time injuries per million man-hours set a new company record. The report pointed out that employee turnover per 1,000 employees was 32 per cent less than the average for the chemical industry and 45 per cent less than the average for all manufacturing industries.



ALEX. M. McIVER Established 1915 H. H. McIVER

ALEX. M. McIVER & SON

BROKERS

SPECIALIZING

- Sulphuric Acid
- Nitrogenous Materials
- Blood and Fertilizer Tankage
- Phosphate Rock
- Castor Pomace
- Oil Mill Products
- High Testing Dolomitic Lime
- "Riceland" Ground Rice Hulls
- Ammoniated Base and Superphosphate

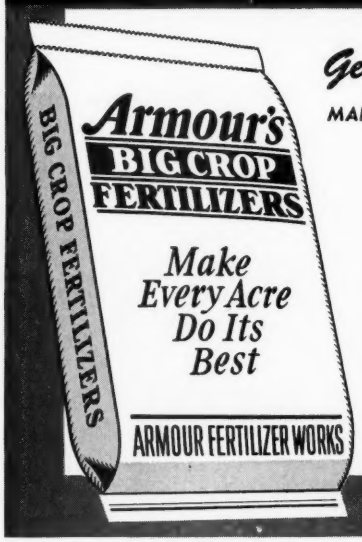
Representatives: Morgan Bros. Bag Company,
Burlap Bags Paper Bags Cotton Bags

GROUND COTTON BUR ASH, 30/40% K_2O POTASH

Peoples Office Building Charleston, S. C.

Phones: Local 2-4627—L. D. 921-922

ARMOUR FERTILIZER WORKS



General office: HURT BUILDING ATLANTA, GA.

MAILING ADDRESS: P. O. BOX 1685, ATLANTA 1, GA.

Division offices:

Birmingham, Ala.
Montgomery, Ala.
Jacksonville, Fla.
Albany, Ga.
Atlanta, Ga.
Augusta, Ga.
Columbus, Ga.
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East St. Louis, Ill.
New Orleans, La.
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Baltimore, Md.
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Wilmington, N. C.
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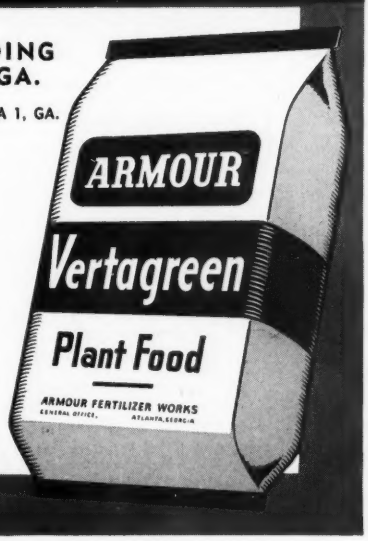
Sandusky, Ohio
Columbia, S. C.
Nashville, Tenn.
Dallas, Tex.
Houston, Tex.
Norfolk, Va.
Havana, Cuba
San Juan, Puerto Rico



Superior Quality

Reliable Service

BURLAP AND COTTON
NEW AND USED
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MENTE & CO., INC.
Isaac T. Rhea, Pres.
Savannah • New Orleans • Houston

TEXTILE BAG SPECIALISTS SINCE 1885

FEEDING AND FERTILIZER MATERIALS

(SINCE 1898)

•

SAMUEL D. KEIM

1343 ARCH STREET

PHILADELPHIA 7, PA.

Farm Chemicals Needed on

Rubber Plantations, Too

Photos Courtesy of Natural Rubber Institute

MALAYA'S rubber industry, laid in ruins by the Japanese occupation, has returned to peak production. Despite harassment by Communist-led guerrillas, the rubber growers of Malaya produced a record crop during 1950. Over a million tons of this valuable commodity were exported, about one third of which entered the United States to play an important part in our defense mobilization efforts.

Half of Malaya's 3,500,000 acres of rubber plantings is contained in large rubber farms or estates. These plantations have from 100 to 10,000 acres each and are owned by Europeans, Asians, and Americans. Most of the workers are Tamils from India and Chinese who entered Malaya to obtain the higher wages and better living conditions offered there.

Few native Malayans are employed on these plantations, most preferring to work their own small rubber farms. There are 25,000 of these three- to five-acre holdings, a few of which are owned by Chinese and other Asians. Although rubber is their main crop, most of these small farmers produce their own food and manage to live well according to Asian standards.

Rubber farmers sell their smoked or unsmoked sheets of rubber to local dealers, usually Chinese shopkeepers, who in turn, sell their purchases to larger dealers who sort, grade and bale the best smoked rubber for export. Unsmoked material together with scrap and lump rubber is sent to remilling factories located usually near large towns. These plants are for the most part owned and operated by Chinese companies.

Malaya has an extension service of its own, owned

Dusting machines are carried on the backs of natives. The sulfur powder contained in this duster is being applied for the control of leaf disease.

Supervisors of one of the larger rubber farms inspect vegetation for insect damage. Note armed guard.

and financed entirely by rubber growers. All producers, regardless of size, aid in supporting the Rubber Research Institute of Malaya located at Kuala Lumpur. Through research and field experiments the Institute has aided greatly in the development of better rubber. RRI representatives go throughout the country advising growers on all phases of rubber production, including the use of pesticides and fertilizers.

Farmer's cooperatives first appeared in Malaya during 1948. During that year at Kampong Mobuk in northern Malaya, Haji Ahmad, with the advice

Jungle rubber fields are sprayed for weed control. This worker is using sodium arsenite and a small tank sprayer to control weed growth near his trees.

FUR-AG
FURFURAL RESIDUE

The STERILIZED . . . . . Organic Conditioner

Heated to 350° F for several hours in the presence of steam and small amounts of acid, FUR-AG is freed from plant diseases, insects, seeds, and other similar contaminants. This is an important consideration in the selection of FUR-AG as the conditioner for your fertilizer.

In addition, FUR-AG has the properties you expect in a good conditioner. It speeds up curing in the pile, helps prevent mixed goods from caking and provides bulk. Best of all, FUR-AG is produced and available in volume the year around. More complete information on request.

The Quaker Oats Company
CHEMICALS DEPARTMENT
334 Merchandise Mart
Chicago 54, Illinois

TC
TENNESSEE CORPORATION

TRIPLE SUPERPHOSPHATE

46 to 48% Available Phosphoric Acid

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20% SUPERPHOSPHATE

Sales Agents: Bradley & Baker
155 East 44th St. New York, N. Y.

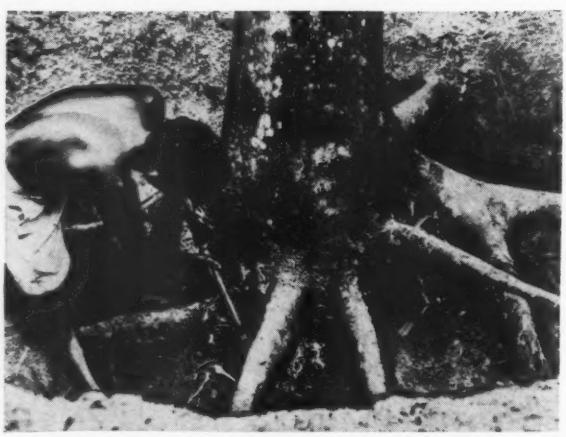
U. S. Phosphoric Products
Division
TENNESSEE CORPORATION
Tampa, Florida

PLANTERS FERTILIZER & PHOSPHATE COMPANY

Manufacturers of

Sulphuric Acid, Superphosphate, Ammoniated Superphosphate Base, Mixed Goods

CHARLESTON, S. C.
Box 865



Natives dig soil from around the roots of rubber trees so that they may be inspected for signs of root disease. Infected roots found are removed.

and help of Malay Rubber Instructor Mohd Rouse and the cooperation of his neighbors, opened a small central factory. The RRI assisted in developing this co-op by loaning equipment and enough cash to cover initial latex purchases. Now most of the farmers within an area of 600 to 700 acres sell their products to the factory operated by Haji Ahmad.

Before the co-op was set up these farmers were producing smoked sheet rubber of a rather poor quality which was sold locally for considerably less than the market price for ribbed smoked sheet. Through the factory they sell directly to the Penang market and 90 per cent of the output rates the No. 1 RSS price. Already cash advances from the RRI have been repaid and loaned equipment is gradually being purchased. The success of Haji Ahmad and his neighbors has encouraged others and now co-operatives are forming in all parts of Malaya.

Malayan growers have progressed rapidly despite the fact that their country receives no Marshall or similar aid. Its rapid recovery from the last war has provided a strong local economy that makes Malaya a strong anti-communist force in Asia. ◆

Fertilization and soil care are as important in rubber growing as in corn production. Soils and fertilizers are examined in this RRI laboratory.

JAITE

HEAVY DUTY MULTI-WALL PAPER BAGS

OFFER DEPENDABLE PROTECTION FOR

YOUR FERTILIZER

THE JAITE COMPANY

"Manufacturers of Paper and Paper Bags"

JAITE, OHIO

"IT'S IN THE J BAG"

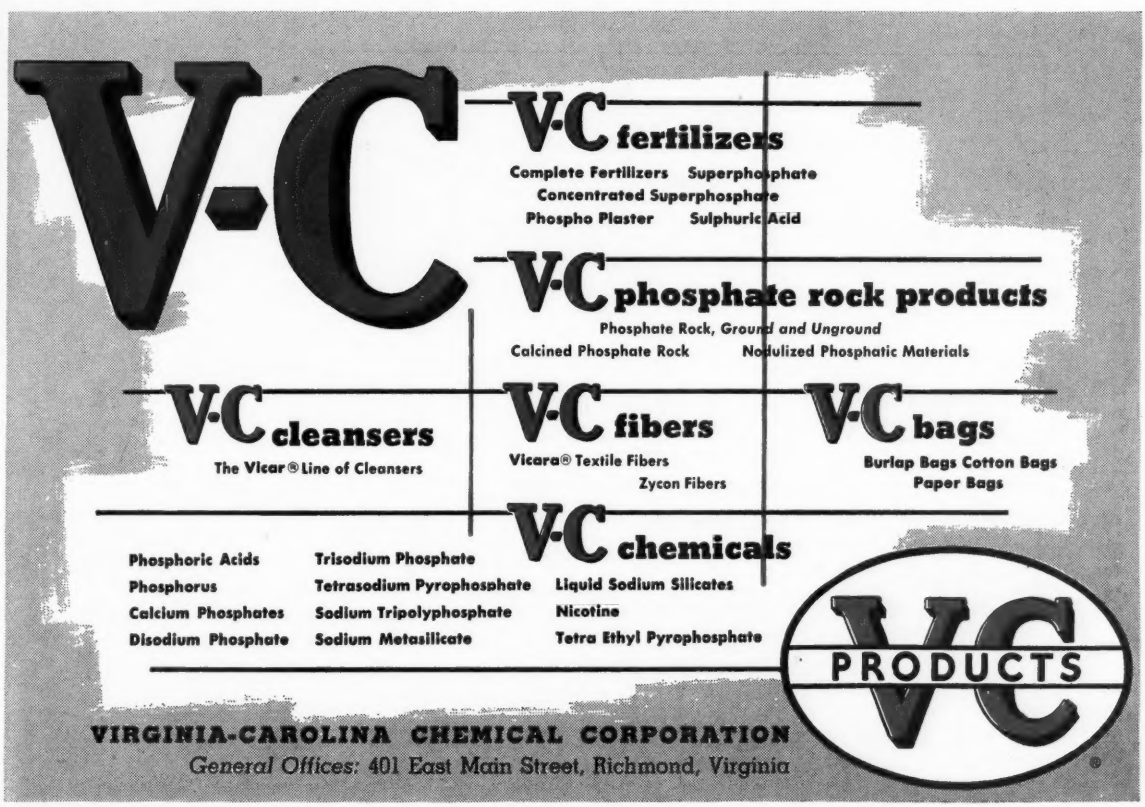
SINCE 1905

Correction, Please!

In our survey of the fertilizer industry which we presented last month, we showed that a very large segment of the industry is interested in or already engaged in the manufacture of pest-control chemicals. However, in the table giving the results of the survey according to regions of the country, we erred. In the "Total %" column listing the "Percentage Who Sell Pesticides," the figure given was 39.9 per cent. It should have been 55.8 per cent. Just to help keep the record straight, here the table is again, this time with the correct totals.

◆

Percentage who	Regions of the Country										
	New England	Middle Atlantic	South Atlantic	East No. Central	East So. Central	West No. Central	West So. Central	Mountain	Pacific	Other	Total %
Sell Pesticides	30%	66.6%	64.8%	34.7%	51.3%	45.5%	50%	71.4%	64.6%	40%	**55.8**
Consider Selling Pesticides	0%	36.7%	14%	5.8%	16.6%	0%	40%	0%	27.3%	0%	**16.8**
Manufacture Pesticides	33.3%	68.2%	16.8%	66.6%	10.5%	60%	40%	60%	60%	100%	**24.9**
Consider Making Pesticides	0%	12.6%	11.8%	33.3%	21%	0%	10%	0%	15%	0%	**11.7**



CAL-MAG OXIDES
CUT YOUR COSTS WITH

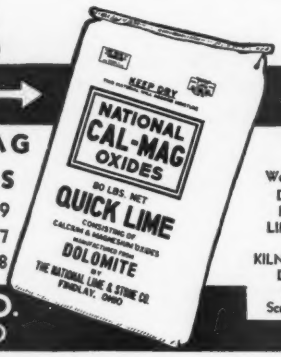
Unexcelled for its superior Dehydrating, Neutralizing, and Curing factors in the preparation of better fertilizers. Write for complete information.

PROMPT SHIPMENTS

Three railroads serve our Carey, Ohio plant--assuring prompt delivery--everywhere.

CAL-MAG OXIDES

MgO	40.39
CaO	58.07
TNP	203.88



We Also Produce
DOLOMITIC HYDRATED LIME (165 TNP)
and
KILN DRIED RAW DOLOMITE (107 TNP)
Screened to size

The NATIONAL LIME and STONE CO.
General Offices • • • • • FINDLAY, OHIO

SOUTHERN STATES PHOSPHATE and FERTILIZER COMPANY
SAVANNAH, GEORGIA
Manufacturers of
SULPHURIC ACID, SUPERPHOSPHATE, COMPLETE FERTILIZERS
and ALL TYPES OF BASE GOODS
EXPORT ORDERS SOLICITED

FERTILIZER MACHINERY and ACIDULATING EQUIPMENT
BATCH MIXERS — PULVERIZERS — CAGE MILLS — SCREENS — SCALES
ELEVATORS, AND ALL OTHER EQUIPMENT FOR COMPLETE PLANTS
ATLANTA UTILITY WORKS EAST POINT, GA.

For
"high-nitrogen"
fertilizer — use
Koppers Ammonium Sulphate!

Koppers offers a good commercial grade of ammonium sulphate—the element that is so essential to fertilizer because of its high nitrogen content.

KOPPERS

KOPPERS COMPANY, INC.
Tar Products Division
Pittsburgh 19, Pa.

Characteristics

Koppers Ammonium Sulphate comes in crystals with low free-acid and moisture content. The nitrogen content is guaranteed to be not less than 20.5%.

Shipment

From St. Paul, Minn. and Kearny, N. J., Koppers Ammonium Sulphate is shipped in 100 lb. and 200 lb. bags—also in boxcars and trucks. From Granite City, Ill. and Midland, Pa., it is shipped only in boxcars and trucks.

BUYERS' GUIDE • Classified Index to Advertisers in "American Fertilizer & Allied Chemicals"

AGRICULTURAL CONSULTANTS
Bailey & Lerch, Washington, D. C.

AMMONIA—Anhydrous and Liquor
Barrett Div., Allied Chemical & Dye Corp., New York City
Commercial Solvents Corp., New York City
Lion Oil Co., El Dorado, Ark.
Phillips Chemical Co., Bartlesville, Okla.
Spencer Chemical Co., Kansas City, Mo.

AMMONIUM NITRATE
Lion Oil Co., El Dorado, Ark.
Phillips Chemical Co., Bartlesville, Okla.
Spencer Chemical Co., Kansas City, Mo.

BAG MANUFACTURERS—Burlap
Bemis Bros. Bag Co., St. Louis, Mo.
Mente & Co., Inc., New Orleans, La.
Virginia-Carolina Chemical Corp., Richmond, Va.

BAG MANUFACTURERS—Cotton
Bemis Bro. Bag Co., St. Louis, Mo.
Mente & Co., Inc., New Orleans, La.
Virginia-Carolina Chemical Corp., Richmond, Va.

BAG MANUFACTURERS—Paper
Bemis Bro. Bag Co., St. Louis, Mo.
International Paper Co., Bagpak Div., New York City
Hammond Bag & Paper Co., Wellsburg, W. Va.
Jaite Company, The, Jaite, Ohio
Kraft Bag Corporation, New York City
Mente & Co., Inc., New Orleans, La.
Raymond Bag Co., Middletown, Ohio
Virginia-Carolina Chemical Corp., Richmond, Va.

BAGS—Dealers and Brokers
Ashcraft-Wilkinson Co., Atlanta, Ga.
McIver & Son, Alex, M., Charleston, S. C.

BAG CLOSING MACHINES
International Paper Co., Bagpak Div., New York City

BAG PRINTING MACHINES
Schmutz Mfg., Louisville, Ky.

BAGGING MACHINES—For Filling Sacks
Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Works, Aurora, Ind.

BONE PRODUCTS—Bone Black
American Agricultural Chemical Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Jackle, Frank R., New York City
McIver & Son, Alex M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

BORAX AND BORIC ACID
American Potash and Chem. Corp., New York City

BROKERS
Ashcraft-Wilkinson Co., Atlanta, Ga.
Jackle, Frank R., New York City
Keim, Samuel D., Philadelphia, Pa.
McIver & Son, Alex. M., Charleston. S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

BUCKETS—For Hoists, Cranes, etc.
Hayward Company, The, New York City

BUCKETS—Elevator
Baughman Manufacturing Co., Jerseyville, Ill.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Mach. Works, Aurora, Ind.

CARS AND CART
Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Mach. Works, Aurora, Ind.

CASTOR POMACE
McIver & Son, Alex. M., Charleston, S. C.

CHEMICALS
American Agricultural Chemical Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Barrett Div., Allied Chemical & Dye Corp., New York City
Commercial Solvents Corp., New York City
Davison Chemical Corporation, Baltimore, Md.
International Minerals & Chemical Corporation Chicago, Ill.
Lion Oil Company, El Dorado, Ark.
Koppers Company, Inc., Tar Products Div., Pittsburgh, Pa.
McIver & Son, Alex. M., Charleston, S. C.
Phillips Chemical Co., Bartlesville, Okla.
Spencer Chemical Co., Kansas City, Mo.
United States Steel Corp., New York City
Virginia-Carolina Chemical Corp., Richmond, Va.
Woodward & Dickerson, Inc., Philadelphia, Pa.

CHEMISTS AND ASSAYERS
Gascoyne & Co., Baltimore, Md.
Shuey & Company, Inc., Savannah, Ga.
Wiley & Company, Baltimore, Md.

CONDITIONERS
Jackle, Frank R., New York City
Keim, Samuel D., Philadelphia, Pa.
McIver & Son, Alex. M., Charleston, S. C.
National Lime & Stone Co., Findlay, Ohio
Quakers Oats Company, Chicago, Ill.

COTTONSEED PRODUCTS
Ashcraft-Wilkinson Co., Atlanta, Ga.
Jackle, Frank R., New York City
McIver & Son, Alex. M., Charleston, S. C.

DRYERS
Sackett & Sons Co., The A. J., Baltimore, Md.

ENGINEERS—Chemical and Industrial
Chemical Construction Corp., New York City
Marietta Concrete Corporation, Marietta, Ohio
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Mach. Works, Aurora, Ind.
Titlestad Corporation, Nicolay, New York City

FERTILIZER (Mixed) MANUFACTURERS
American Agricultural Chemical Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Davison Chemical Corporation, Baltimore, Md.
International Minerals & Chemical Corporation, Chicago, Ill.
Planters Fertilizer & Phosphate Co., Charleston, S. C.
Southern States Phosphate & Fertilizer Co., Savannah, Ga.
Virginia-Carolina Chemical Corp., Richmond, Va.

FISH SCRAP AND OIL
Ashcraft-Wilkinson Co., Atlanta, Ga.
Jackle, Frank R., New York City
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

HOPPERS
Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Works, Aurora, Ind.

IMPORTERS, EXPORTERS
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Southern States Phosphate & Fertilizer Co., Savannah, Ga.
Woodward & Dickerson, Inc., Philadelphia, Pa.

INSECTICIDES
American Agrictultural Chemical Co., New York City
Kolker Chemical Works, Newark, N. J.

LIMESTONE
American Agricultural Chemical Co., New York City
Ashcraft-Wilkinson Co., Atlanta, Ga.
McIver & Son, Alex. M., Charleston, S. C.
National Lime & Stone Co., Findlay, Ohio

LOADERS—Car and Wagon
Hough Co., The Frank G., Libertyville, Ill.
Sackett & Sons Co., The A. J., Baltimore. Md.

MACHINERY—Acid Making and Handling
Atlanta Utility Works, The, East Point, Ga.
Chemical Construction Corp., New York City
Monarch Mfg. Works, Inc., Philadelphia, Pa.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Mach. Works, Aurora, Ind.

MACHINERY—Ammoniating
Sackett & Sons Co., The A. J., Baltimore, Md.

MACHINERY—Grinding and Pulverizing
Atlanta Utility Works, The, East Point, Ga.
Bradley Pulverizer Co., Allentown, Pa.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Mach. Works, Aurora, Ind.

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BUYERS' GUIDE

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MACHINERY—Material Handling
Atlanta Utility Works, The, East Point, Ga.
Baughman Manufacturing Co., Jerseyville, Ill.
Hayward Company, The, New York City
Hough Co., The Frank G., Libertyville, Ill.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Mach. Works, Aurora, Ind.

MACHINERY—Mixing, Screening and Bagging
Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Mach. Works, Aurora, Ind.

MACHINERY—Power Transmission
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Mach. Works, Aurora, Ind.

MACHINERY—Superphosphate Manufacturing
Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Mach. Works, Aurora, Ind.

MANGANESE SULPHATE
McIver & Son, Alex. M., Charleston, S. C.

MINOR ELEMENTS
Tennessee Corporation, Atlanta, Ga.

MIXERS
Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Mach. Works, Aurora, Ind.

NITRATE OF SODA
American Agricultural Chemical Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Barrett Div., Allied Chemical & Dye Corp., New York City
International Minerals & Chemicals Corporation, Chicago, Ill.
McIver & Son, Alex. M., Charleston, S. C.

NITROGEN SOLUTIONS
Barrett Div., Allied Chemical & Dye Corp., New York City
Lion Oil Company, El Dorado, Ark.
Phillips Chemical Co., Bartlesville, Okla.
Spencer Chemical Co., Kansas City, Mo.

NITROGENOUS ORGANIC MATERIAL
American Agriculture Chemical Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
International Minerals & Chemical Corporation, Chicago, Ill.
Jackle, Frank R., New York City
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

NOZZLES—Spray
Monarch Mfg. Works, Philadelphia, Pa.

PHOSPHATE ROCK
American Agricultural Chemical Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
International Minerals & Chemical Corporation, Chicago, Ill.
McIver & Son, Alex. M., Charleston, S. C.
Virginia-Carolina Chemical Corp., Richmond, Va.

PLANT CONSTRUCTION—Fertilizer and Acid
Atlanta Utility Works, The, East Point, Ga.
Chemical Construction Corp., New York City
Monsanto Chemical Co., St. Louis, Mo.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Mach. Works, Aurora, Ind.
Titlestad Corporation, Nicolay, New York City

POTASH SALTS—Dealers and Brokers
American Agricultural Chemical Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
International Minerals & Chemical Corporation, Chicago, Ill.
Jackle, Frank R., New York City
McIver & Son, Alex. M., Charleston, S. C.

POTASH SALTS—Manufacturers
American Potash and Chemical Corp., New York City
Potash Co. of America, New York City
International Minerals & Chemical Corporation, Chicago, Ill.
United States Potash Co., New York City

PRINTING PRESSES—Bag
Schmutz Mfg. Co., Louisville, Ky.

REPAIR PARTS AND CASTINGS
Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Mach. Works, Aurora, Ind.

SCALES—Including Automatic Bagging
Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Mach. Works, Aurora, Ind.

SCREENS
Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Mach. Works, Aurora, Ind.

SEPARATORS—Air
Sackett & Sons Co., The A. J., Baltimore, Md.

SPRAYS—Acid Chambers
Monarch Mfg. Works, Inc., Philadelphia, Pa.

STORAGE BUILDINGS
Marietta Concrete Corporation, Marietta, Ohio

SULPHATE OF AMMONIA
American Agricultural Chemical Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Barrett Div., Allied Chemical & Dye Corp., New York City
Jackle, Frank R., New York City
Koppers Co., Inc., Tar Products Div., Pittsburgh, Pa.
Lion Oil Co., El Dorado, Ark.
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Phillips Chemical Co., Bartlesville, Okla.
United States Steel Corp., New York City
Woodward & Dickerson, Inc., Philadelphia, Pa.

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Texas Gulf Sulphur Co., New York City

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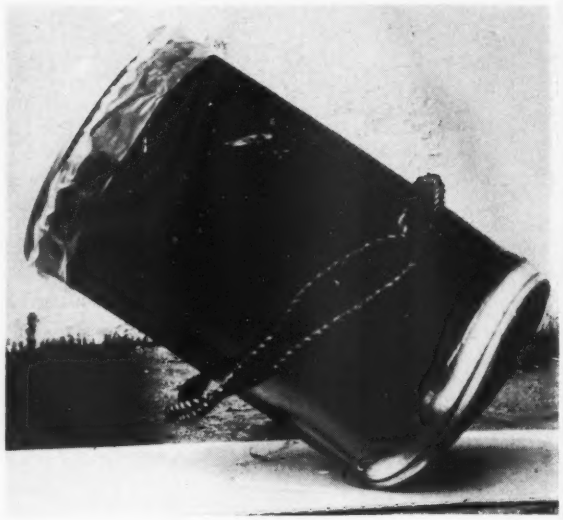

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U. S. Pat. No. 2,511,481, owned by Rohm & Haas Company, covers this new drum package. Licenses thereunder are available on a nominal basis to responsible shippers. None of the elements of the drum package is manufactured by Rohm & Haas Company but all are purchased from suppliers as noted below and assembled by said company solely for its own use.

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Telephone: STERLING 4990

Our New York office will be discontinued as of the above date.

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